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BY

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CONTENTS OF VOLUME XXXV.

NUMBER 1

PAGE

1. **Report and Comments on the Eyeball-Injuries by Iron Foreign Bodies at the New York Ophthalmic and Aural Institute, New York City.** By Dr. LOUIS STOLL, House Surgeon, and Dr. HERMAN KNAPP, Executive Surgeon . 1

2. **Some Injuries to the Eye Following Subconjunctival Injection of Salt Solution.** By Dr. L. ALEXANDER, Nuremburg. Translated from the German Edition, Vol. XLIX., 4, April, 1904, by Dr. ALFRED BRAUN, New York. 15

3. **Are the Anomalous Trichromates Fit for Service on Railroads?** By Dr. HUGO FEILCHENFELD, Berlin. Translated from the German Edition, May, 1904, by Dr. MATTHIAS LANCKTON FOSTER 25

4. **Hæmolytic Injections for Recurrent Hemorrhages into the Vitreous.** By Prof. ELSCHNIG, Vienna. Translated from the German Edition, Vol. LI., March, 1905, by Dr. MATTHIAS LANCKTON FOSTER 33

5. **Congenital Orbital Cyst Associated with Microphthalmus.** By Dr. RAY CONNOR, Detroit, Mich. (With Text-Plates I. and II.) 45

6. **A Plaster Operation on the Eyelids by Means of Skin Flaps Taken from the Neck.** By E. F. SNYDACKER, M.D., Chicago, Oculist, Michael Reese Hospital, St. Mary of Nazareth. (With one figure in the text) 57

7. **Report of the Meeting of the Ophthalmological Section of the British Medical Association at Leicester, Wednesday and Thursday, July 26 and 27, 1905** 61

8. **Report of the Thirty-Second Meeting of the German Ophthalmological Society at Heidelberg, August 3 to 5, 1905.** Reported by Dr. TREUTLER, Dresden. Translated by Dr. MATTHIAS LANCKTON FOSTER 73

(Continued from Page 671 of Volume XXXIV.)

162873

PAGE

9. **Transactions of the Twenty-Second Annual Meeting of the French Ophthalmological Society, May 1 to 4, 1905.** Reported by Dr. E. BERGER, Paris. Translated from the *Arch. f. Augenheilk.*, Vol. LII., September, 1905, by Dr. MATTHIAS LANCKTON FOSTER 83

10. **Systematic Report on the Progress of Ophthalmology in the Fourth Quarter of the Year 1904.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREAUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others. Translated by Dr. PERCY FRIDENBERG, New York 90

11. **Obituary:** SWAN M. BURNETT 126

NUMBERS 2 and 3

1. **The Knife-Needle Operation for Secondary Capsular Cataract.** By EDWARD JACKSON, M.D., Denver. (With three text-figures.) 127

2. **The Treatment of After-Cataract.** By Major HENRY SMITH, I.M.S., Civil Surgeon, Jullundur 137

3. **On the Etiology of Lamellar Cataract.** By H. KNAPP . . 141

4. **Plexiform Neuroma of the Orbit.** By Drs. CHAS. H. BEARD and E. V. L. BROWN, Chicago. (With one text-plate, in violet monochrome, No. III.) 145

5. **A Case of Parinaud's Conjunctivitis, Accompanied by Erythema Nodosum and Tonsillitis; with a Summary of the Thirty-four Reported Cases.** By CHARLES NELSON SPRATT, B.S., M.D., Minneapolis, Minn. 152

6. **A Case of Antipyrin Amaurosis Induced by One Hundred and Thirty Grains Taken in Forty-eight Hours.** By F. C. HOTZ, M.D., Chicago. (With two charts in text.) . . 160

7. **A Case of Transient Lead Amaurosis.** By Dr. OTTO LOEWE, Frankfort-on-the-Main. Translated from the German Edition, October, 1903, by Dr. MATTHIAS LANCKTON FOSTER . 164

PAGE

8. **The Action of Alypin, a New Anæsthetic, upon the Eye.** By Dr. ED. HUMMELSHEIM, Privat-Docent at Bonn. Translated from the German Edition, LIII., 1, October, 1895, by Dr. WARD A. HOLDEN 172

9. **Abstracts of Articles in Vol. XLI. of the German Edition, not Previously Published.** By Dr. MATTHIAS LANCKTON FOSTER, New York 175

10. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom.** By Mr. C. DEVEREUX MARSHALL. 195

11. **Systematic Report on the Progress of Ophthalmology in the First Quarter of the Year 1905.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others. Translated by Dr. MATTHIAS LANCKTON FOSTER 198

A.—Prof. C. HORSTMANN: General ophthalmological literature, 198; General pathology, diagnosis, and therapy, 202; Instruments and remedies, 209.

B.—Dr. G. ABELSDORFF: Anatomy, 213; Physiology, 215; Refraction, 220; Muscles and nerves, 223.

C.—Dr. R. SCHWEIGGER: Lids, 225; Lachrymal apparatus, 226; Orbit and neighboring cavities, 227; Conjunctiva, 228; Cornea, sclera, anterior chamber, 233.

D.—Dr. O. BRECHT: Lens, 239; Iris, 240; Choroid, 242; Vitreous, 242; Glaucoma, 243; Sympathetic ophthalmia, 245.

E.—Dr. H. MEYER: Retina and functional disturbances, 246; Optic nerve, 250; Injuries, foreign bodies, parasites, 252; Ocular disturbances in general diseases, 254.

12. **Book Reviews** 259

I.—Atlas and Epitome of Operative Ophthalmology. By Prof. O. HAAB, of Zürich. Revised translation, with notes and additions, edited by G. E. DE SCHWEINITZ, A.M., M.D.

II.—The Ophthalmoscope and How to Use it. By JAS. THORINGTON, A.M., M.D.

III.—Subjective Sensations of Sight and Sound. By Sir WM. R. GOWERS, M.D., F.R.C.P., F.R.S.

PAGE

IV.—The Optical Dictionary. Edited by CHAS. HYATT-WOOLFE, F.R.P.S.

V.—The Physician's Visiting List. (Lindsay & Blakiston.)

VI.—Diseases of the Eye, a Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. DE SCHWEINITZ, A.M., M.D.

VII.—Biographic Clinics, Vol. III. By GEO. M. GOULD, M.D.

VIII.—The World's Anatomists. By G. W. H. KEMPER.

IX.—The Ophthalmic Year-Book for 1904. By EDWARD JACKSON, M.D., Denver, and GEORGE DE SCHWEINITZ, M.D., Philadelphia.

X.—Anleitung zur Augenuntersuchung bei Algemeinerkrankung (Introduction to Examination of the Eyes in General Diseases). By Dr. HEINE, Breslau.

XI.—Précis de Therapeutique Oculaire. By Dr. SCRINI, Paris.

XII.—Einfuhrung in die Medicinische Optik (Introduction into Medical Optics). By Dr. A. GLEICHEN, Berlin.

NUMBER 4

1. **Epithelial Cyst Formation in the Iris, with Illustrative Cases.** By Dr. EDWARD L. OATMAN, Brooklyn, New York. (With eight figures on Text-Plates IV.–VII.) . . . 309

2. **Case of Melanosarcoma of the Choroid and Orbit.** By Dr. EDWARD L. OATMAN, Brooklyn. (With two figures on Text-Plate VIII.) 318

3. **Traumatic Laceration of the Inferior Rectus Muscle.** By H. MOULTON, B.S., M.D., Fort Smith, Ark. 321

4. **A Case of Orbital Endothelioma—Radical Operation at the New York Ophthalmic and Aural Institute, by Dr. Herman Knapp. No Recurrence after Twenty-six Years.** Reported by Dr. JAMES M. COOPER, Detroit, Mich. (With an illustration on Text-Plate X.) 324

5. **Glioma of the Retina. Reports of Four Cases.** By Dr. S. C. AYRES, Cincinnati, O. (With two illustrations on Text-Plate XI.) 329

6. **On Pigmentation of the Retina after Optico-Ciliary Neurectomy in Man.** By Dr. THEODOR F. STUDER. Abridged Translation from the German Edition, Vol. LIII., 1905, by Dr. WARD A. HOLDEN. (With eight appended plates, A–H.) 333

PAGE

7. **Posterior Sclerotomy as a Preliminary to Iridectomy in Acute Glaucoma.** By ARNOLD KNAPP, M.D. 349

8. **Two Cases of Osteoma of the Orbit Successfully Treated by Operation.** By ARNOLD KNAPP, M.D. (With an illustration on Text-Plate IX.) 353

9. **Eye Infection—Third Hundred Cases with Bacteriological Examination.** By Dr. DORLAND SMITH, Bridgeport, Conn. 356

10. **A Rare Case of Thrombosis of the Cavernous Sinus Following Orbital Thrombophlebitis.** By Dr. FRIEDRICH STOCKER, Lucerne. Abridged Translation from the *Arch. f. Augenheilk.*, Vol. XLIV., 1901, Supplementary Number, a Festschrift for Dr. E. Pflueger, by Dr. MATTHIAS LANCKTON FOSTER. 378

11. **Abstracts of Articles in Vol. XLII. of the German Edition, 1900, not Previously Translated.** By Dr. MATTHIAS LANCKTON FOSTER, New York. 383

12. **Report of the Meetings of the Ophthalmological Society of the United Kingdom,** February 8 and March 8, 1906. By C. DEVEREUX MARSHALL. 391

13. **Report of the Meetings of the Ophthalmological Section, New York Academy of Medicine,** January 15 and February 19, 1906. By Dr. H. W. WOOTTON, Secretary. 397

NUMBER 5

1. **On Refraction at a Toric Surface.** By H. C. LOMB, Rochester, New York. (With five figures in the text.) . . . 415

2. **Quinine Amaurosis with Report of a Case.** By FRANK JUDSON PARKER, M.D. (With two Colored Plates.) . . . 420

3. **A Case of Microphthalmus with Upper-Lid Cyst.** Clinical Report by Dr. CHARLES H. MAY. Pathological Report by Dr. WARD A. HOLDEN. (With six figures on Text-Plates XII. and XIII.) 424

4. **A Time-Saving Addition to Test-Type Cards.** By HOLBROOK LOWELL, M.D., Boston, Mass. (With one figure on Text-Plate XIV.) 428

5. **Abstract Report of the Section on Ophthalmology of the American Medical Association,** Boston, Mass., June 5-8, 1906 430

PAGE

6. **Report of Meetings of the Ophthalmological Section of the New York Academy of Medicine,** October 16, November 20, and December 18, 1905, and April 16 and May 21, 1906. By Dr. H. W. WOOTTON, Secretary 461

7. **Report of the Proceedings of the Ophthalmological Society of the United Kingdom,** May 3, June 14, and July 13, 1906. By Mr. C. DEVEREUX MARSHALL 501

8. **Book Reviews:**

XIII.—**Serumtherapie bei infectiösen Augenerkrankungen.** (Serum Therapy in Infectious Eye Diseases.) By Prof. THEODORE AXENFELD, Freiburg. 506

XIV.—**The Combined Treatment in Diseases of the Eye.** By G. HERBERT BURNHAM, M.D., Prof. of Ophthalmology and Otology at the University of Toronto . . 508

NUMBER 6

1. **Prevention and Treatment of Eye Affections from Venereal Disease.** An Address Delivered, by Invitation, October 18, 1906, before the Philadelphia Society for the Study and Prevention of Social Disease. By HERMAN KNAPP, M.D., New York 511

2. **The Dependence of Accommodation and Motility on the Refraction of the Eye.** By HERMAN KNAPP, M.D., New York . 519

3. **Sudden Blindness Following Suppurative Conditions about the Eyeball.** By ARNOLD KNAPP, M.D. 524

4. **Double Congenital Aniridia with Glaucoma and Cataract. Extraction with Resulting Good Vision. Observations on the Action of Eserin where the Iris Is Absent.** By Dr. DAVID N. DENNIS, Erie, Pa. 527

5. **A Rare Path of Infection of an Orbital Abscess.** By Dr. C. BARCK, St. Louis. (With two figures on Text-Plate XV.) . 531

6. **Clinical Contributions to the Study of Atrophy of the Iris.** By Dr. ADOLF FRANCK. Translated from the German Edition, Vol. XLVII., April, 1903, by Dr. PERCY FRIDENBERG. (With six figures on Plates VI–VII.) 535

7. **Transactions of the Ophthalmological Section of the XVth International Medical Congress at Lisbon April 19 to 26, 1906.** Reported by Dr. VON PFLUGK, Dresden. Translated from the German Edition for May, 1906, by Dr. MATTHIAS LANCKTON FOSTER 553

PAGE

8. **Systematic Report on the Progress of Ophthalmology in the Second Quarter of the Year 1905.** By Dr. G. ABELSDORFF, Berlin; Prof. ST. BERNHEIMER, Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others. Translated by Dr. PERCY FRIDENBERG, New York . 573

A.—Prof. C. HORSTMANN: General ophthalmological literature, 573; General pathology, diagnosis, and therapeutics, 581; Medicaments and instruments, 592.

B.—Dr. ABELSDORFF: Anatomy, 598; Physiology, 602; Refraction and accommodation, 610; Motor apparatus, 615.

C.—Dr. R. SCHWEIGGER: Lids, 620; Lachrymal apparatus, 622; Orbit and accessory cavities, 624; Conjunctiva, 627; Cornea, sclera, and anterior chamber, 630.

D.—Dr. O. BRECHT: Lens, 636; Iris, 637; Choroid, 639; Vitreous, 640; Glaucoma, 641; Sympathetic ophthalmia, 642.

E.—Dr. MEYER: Retina and functional disturbances, 643; Optic Nerve, 648; Injuries, foreign bodies, and parasites, 651; Ocular disturbances in general disease, 652.

9. **Obituary**: Dr. FRANK BULLER; Dr. SWAN M. BURNETT; Dr. LOUIS DE WECKER; Dr. Med. COUNT JOHN MAGAWLY . . 655

10. **Index of Authors and Subjects of Vol. XXXV.** . . . 659

11. **General Index of Authors and Subjects of Vols. XXIX. to XXXV., Inclusive** 667

ARCHIVES OF OPHTHALMOLOGY.

REPORT AND COMMENTS ON THE EYEBALL-INJURIES BY IRON FOREIGN BODIES AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE, NEW YORK CITY.

By Dr. LOUIS STOLL, House Surgeon, and Dr. HERMAN KNAPP, Executive Surgeon.

DR. HERMAN KNAPP, in March, 1899, communicated to the Section of Ophthalmology and Otology of the New York Academy of Medicine a paper entitled "Clinical Experiences with Haab's Powerful Electro-Magnet" (these Archives, xxviii., p. 167).

In that paper he reported fifteen cases, as published in American medical literature, and thirteen additional cases from his own practice, these latter having occurred subsequent to May, 1898, at which date Haab's large electro-magnet had been set up in the New York Ophthalmic and Aural Institute. Since the writing of that paper, fifty more cases have come under Dr. Knapp's observation, which Dr. Stoll has collected from the hospital record books. After that there are a smaller number, but instructive cases, which the present House Surgeon, Dr. Cooper, compiled according to the hospital record books. They will be presented, in accordance with the arrangement used by Dr. Knapp in his first paper, and each of the thirteen cases previously reported will be mentioned again in its proper group, for the sake of the completeness of the subject to the time of publication.

First group: Foreign bodies imbedded in the surface of the eye.

A—In the cornea.

Case 34.—Louis Krug, æt. thirty-five, Hoboken, presented himself February 10, 1900. A piece of steel was fixed in the

corneal tissue. Removal by the foreign-body needle was not tried, fearing that it might push the fragment of steel into the anterior chamber. Easily extracted with Haab's magnet. Measures 2 x 1 x ½*mm*. Admission into the hospital not necessary.

CASE 59.—Kathie Schenk, æt. nineteen, New York, came March 14, 1903. A few hours previously a piece of a sewing-needle struck her cornea; it was deep-seated, and failed to be removed by the foreign-body needle. Easily extracted with Haab's magnet. Wound was healed two days later.

B—In the sclerotic.

CASE 37.—Harry Burns, æt. twenty-five, Brooklyn. A chip of iron had struck his eye and remained fixed in the sclerotic. An unsuccessful attempt was made to extract it by forceps. Extracted by Haab's magnet, without loss or prolapse of vitreous. Patient had not to stay in the hospital. Wound healed; no impairment of sight mentioned.

These three cases were treated in the dispensary department, admission to the hospital not being required. Simple as they seem, we learn the advantage of the magnet in those cases where the removal of pieces of iron from the surface of the eye with the foreign-body needle was for some reason not advisable or physically impossible. In Cases 34 and 37, though it seemed feasible to remove the foreign bodies by other means than the magnet, there was danger of complications as a result of pushing the foreign body entirely through the cornea into the anterior chamber, or through the scleral tissue into the vitreous.

Second group: Foreign body in the anterior portion of the eye, in front of the lens or in it.

A—In the anterior chamber.

CASE 16.—**Piece of steel after piercing the cornea stopped in front of the iris; hypopyon; no lesion of the lens. Extracted through canal of entrance.** Recovery. V = $\frac{20}{70}$.

Meyer Caplan, æt. twenty-eight, Brooklyn, admitted April 27, 1899. Struck in left eye by piece of steel two days ago. Pericorneal congestion; pupil contracted (had eserine given by a physician); iris dull; hypopyon 1*mm*. Severe pain. Perception of light only. A dark object is seen lying in anterior chamber

diagonally across the pupil and attached to the cornea at its one end, resting upon the iris with its other.

Operation.—The tip of a small magnet was placed in front of the eye and brought into contact with the cornea, where the foreign body seemed to be attached. By a few lateral motions it was dislodged. The current being directed straight in front of it, the chip was pulled out easily through the canal of entrance. It was a thin piece of steel, 4 by $\frac{1}{2}mm$ in dimension, with sharp ends. The next day hypopyon had disappeared; the pupil was fully dilated by atropine and clear. Wound healed. Patient discharged the third day. V = $\frac{20}{20}$.

Two of the cases reported by Dr. Knapp may be added as belonging to this group:

Case 1.—Chip of steel in periphery of anterior chamber. Beginning iritis. Extraction by large magnet through entrance canal. Perfect recovery. V = $\frac{20}{20}$.

Case 2.—Piece of steel in anterior chamber; attempts of extraction with small magnet unsuccessful. Hemorrhage. Foreign body disappeared, not indicated by large magnet. Eye blind.

Two of the three cases of this group are worthy of mention, because of complicating iritis, which in one case was present only forty-eight hours after the accident. In both the inflammation was controlled and good vision obtained. The infection had been limited to the anterior portion of the eye, and the lens showed no lesion.

In the third case the patient did not come until a week after the injury. The day following the accident, another physician attempted the extraction of the foreign body by a small magnet after making a new corneal incision. He failed, as blood into the anterior chamber hid the chip. On admission into the Institute, a hemorrhage in the vitreous and two wounds in the iris were found; tension was normal; field of vision defective. No evidence of the presence of a foreign body could be obtained. Patient discharged a few days later.

B—In the posterior chamber.

Case 57.—Chip of steel, indistinctly located in posterior chamber, was entangled in iris tissue. Fresh corneal incision, through

which the foreign body was drawn out by Haab's magnet, being still entangled in iris. Iridectomy. Removal of the chip six weeks after the injury. Recovery. V = $\frac{18}{200}$. Beginning cataract.

Tom Hogan, æt. twenty-seven, Bowling Green, Ky., was admitted June 22, 1903, and said his right eye had been struck by a piece of iron six weeks ago. Wound healed quickly but eye remained irritable. Faint corneal scar, small hole in upper temporal portion of iris. Fundus clear after dilatation of the pupil; no foreign body visible. Circumscribed opacity of the lens. On approaching the tip of the giant-magnet toward the eye the iris was drawn toward the cornea near the scar, indicating the presence of the foreign body in the posterior chamber. Attempt failed to lead it through the pupil into the anterior chamber. The chip being entangled in the tissue of the iris, was prevented from getting around the pupillary margin. Fresh incision was made with keratome between the corneal scar and the limbus corneæ, and it was enlarged by Stevens scissors. At the same time iridotomy was performed parallel to the corneal section, enlarging the hole of the iris. After several attempts to get the foreign body through the incision made in the iris failed, the piece of steel covered by the iris was pulled through the corneal wound. The prolapsed portion of the iris was cut off and the iron found in the piece excised. Wound freed from prolapsed iris; pillars free; trace of blood in anterior chamber. The next day no reaction was evident; small hyphæma; wound smooth and clean. During the following week the eye became free from irritation; corneal wound healed nicely, no anterior synechia, but lens became gradually duller, and in the coloboma fine radii appeared extending toward the pupil. No changes in the fundus. V = $\frac{8}{200}$ when discharged.

Case 6.—Piece of steel suspected in posterior chamber; iritis; hypopyon. Large magnet failed; eye recovered. Vision improved to $\frac{20}{70}$.

Case 8.—Same patient as "Case 6"; came back two months after he left the hospital. Eye quiet. At first attempt by Haab's magnet iris bulged; corneal incision. Small Hirschberg, introduced into anterior chamber, failed to extract the foreign body. Large magnet extracted it. Recovery. Cataract removed. V = $\frac{20}{30}$.

Case 13.—Chip of iron three months in eye; irido-cyclitis Sediment at bottom of anterior chamber. In nasal part of iris

an indistinct black spot. After keratotomy iron extracted with Haab's magnet.

The forces which cause the foreign body to stop in front of the lens, as in the cases of this group, are not quite obvious. It is not certain whether the form of the chip, its direction, its rapidity, or the resistance offered by the iris tissue explains the fact that it did not penetrate the comparatively soft tissue of the lens capsule. In Case 57 the foreign body had lodged behind and maybe partially in the iris tissue, not exciting an iritis, and opacifying the lens only to a circumscribed extent. The fact that the foreign body had been fixed so tightly in the posterior layers of the iris seems to justify the idea that it had been attached there by a circumscribed inflammatory process, as is often the case with pieces of steel encapsulated in or upon the retina. The meshes of the iris favor the impaction of small even particles.

C—In the lens.

Case 25.—Small chip of iron in anterior capsule resisted the powerful magnet and had to be removed with extraction of the opaque lens nine days after the accident. Remnants of lens absorbing. Recovery. V = $\frac{8}{200}$.

Honesto Pedro, æt. thirty-eight, Brooklyn, admitted June 23, 1900. Small black particle seen in anterior capsule of the lens. Slight abrasion of cornea. An unsuccessful attempt to extract the foreign body was made. Anterior chamber emptied when corneal wound had been reopened, but foreign body remained in its position. Lens opacifying quickly. Placed before magnet without result; suffered great deal of pain. July 2d, lens was removed partially by linear extraction, the foreign body coming out with the cortical substance. The next day wound was closed, anterior chamber filled, pupil round, some posterior synechiæ. During the following week lens-matter absorbed partially. July 15th, capsule contained some cortical unabsorbed. V = $\frac{8}{200}$ when discharged that day. Foreign body was a thin wedge-shaped piece of iron 0.5 by 1*mm* in dimension.

Case 60.—Small glistening substance in anterior capsule was attracted by Haab at first attempt. Extracted through new corneal section. Recovery. Cataract.

A. Friedmann, æt. thirty-five, New York, admitted October 28, 1903, two days after his right eye had been hurt. No congestion, small scar in lower-nasal portion of cornea, small circumscribed capsular opacity, small glistening foreign body upon the anterior capsule; no sooner was the eye approached toward the magnet than the piece of iron rushed against the posterior surface of the cornea and fell to the bottom of the anterior chamber. With Graefe knife a new section was made through the corneal scar. At the second attempt with the magnet the foreign body rushed out through the corneal incision. The next day wound was closed, anterior chamber filled, no reaction, patient discharged. A week later patient was seen in the Dispensary, his lens being opaque over the entire circumference of the pupil. Cataract extracted May 5, 1904. Vision with glasses $= \frac{20}{50} +$; to be improved by discission.

Case 63.—Chip of iron entered the eye through cornea and lens. Cataract. Extraction of a large piece of iron by Haab's magnet. *Panophthalmitis;* enucleation the fifth day after injury.

A. Jansen, æt. fifty-six, Hoboken, was struck by a piece of steel in his right eye a few hours previous to his admission on March 7, 1904. Wound in centre of cornea; point of the foreign body seen in cataractous lens. Pain when put near giant-magnet; iris bulged. The cornea and the whole globe moved toward magnet. At second attempt foreign body protruded through corneal wound and was extracted by magnet. It was a large, but thin black piece of steel with ragged edges, 6 x 1 x 3*mm* in dimension. No perception of light. During the following days, the lids œdematous, and chemosis, panophthalmitis. Enucleation the fifth day after the injury.

Cases 25 and 60 show nearly the same conditions as far as the size of the foreign body and its location are concerned, but they present an entirely different course. In the former case (25), the chip was not moved by the attracting power of the magnet. It apparently was entangled in the capsule, and not being voluminous enough it could not pierce the tissue blocking its way. It had to be removed with the opaque lens-tissue. In the latter case (60), the chip was attracted and dislodged from the lens; it fell to the bottom of the anterior chamber and was removed in the usual way. There is no reason whatever for the different behavior of the

two chips except that one was dark and perhaps had remained for some time in the eye, where it became oxydized and fixed. The other had been in the eye for but two days and was extracted before oxydation and fixation could take place.

In the third case, a large piece of iron had been successfully extracted by Haab's magnet only a few hours after the injury occurred. It had partially penetrated into the lens and its further progress had been blocked by it. Infection of the vitreous rendered enucleation unavoidable.

Third group: Foreign bodies in posterior portion of the eye, behind the lens.

A—Such as can be seen lying in the vitreous chamber by the ophthalmoscope.

CASE 20.—Piece of steel surrounded by exudate was seen in vitreo two days after the injury. Removal through canal of entrance failed. Extracted through new opening. Prolapse of iris cut off. Slow recovery. Cataract.

Mich. F. Foomey, æt. thirty-four, Rochester, N. Y. Two days ago piece of steel flew into left eye while hammering; slight pain since. Sight impaired since yesterday. Admitted July 26, 1899. Point of entrance plainly visible at nasal side of cornea near limbus; opening in iris; track through lens. With ophthalmoscope piece of steel can be seen lying in lower and inner portion of fundus surrounded by a small quantity of exudate. Vitreous fairly clear. Vision = $\frac{10}{200}$. Field normal.

Operation.—At first no evidence of the presence of a foreign body in the eye, when the magnet was brought into contact with the cornea. Tip of magnet then applied near sclerotic at point where foreign body was known to lie. After moving magnet to and fro for a moment in this region, it was again applied to cornea at the point of entrance. Immediately iris bulged and foreign body engaged in the iris tissue. Corneal section made vertically through scar, and with small magnet a flat piece of steel 3 x 1.5*mm* in dimension was withdrawn. It brought with it the iris, which, being somewhat lacerated, was abscised, leaving a clear coloboma; atropine; bandaged. The next day no decided reaction, but after some days some pericorneal congestion, pupil half dilated; in coloboma a tongue-like projection on anterior capsule, whitish in color, probably exudation from ciliary body;

wound ragged, slightly infiltrated. Cataract developing. During the following months wound became clearer; the tongue-like projection gradually absorbed. Lens swollen; iris bulging; one temporal synechia. – T. No pain. After several relapses during September the eye has gradually and slowly become free from irritation. Tn. Lens becoming more and more opaque. V = perception of light. Discharged September 25, 1899.

CASE 22.—Piece of steel entered at sclero-corneal junction; was seen seven days afterwards in retina imbedded in exudation. Indicated by Haab's magnet. Extraction through new corneal incision along limbus; hemorrhage into vitreous. Recovery.

Purdie, Ireland, æt. forty-five, New Haven, Ct.

While chipping a screw on October 7, 1899, a piece of steel entered left eye at the inner corneo-scleral junction and became lodged in the retina. On admission a week later, on October 14th, he had no pain, hardly any reaction; vitreous clear; retina congested; veins filled. Foreign body seen in retina and sclera near the disk, imbedded in a white fibrinous exudation.

Operation.—Pain was felt when cornea was brought into close contact with Haab's magnet. At the second trial iris was seen bulging. Section with Graefe knife along limbus on lower and nasal side of cornea. At the fourth attempt foreign body was brought to the surface, and bringing the eye very close to the magnet the chip was extracted, 8 x 2 x 1*mm* in dimension. The next day no blood in anterior chamber, fundus illuminable, but no details could be made out; field no more contracted than before the operation; can count fingers.

During the following week, improvement, less congestion, lens clear, details of the background recognizable, wound firmly closed but small portion of the iris adherent to it. Details at periphery of fundus indistinct, but no detachment of retina. October 29th, sight was poor; – T. Lower and inner portion of retina dull, no detachment as yet; disk seen clear. When discharged November 4th, details of fundus not yet discernible; defect of field more extensive and only upper portion of fundus illuminable. Tn. Vision = movement of the hand.

CASE 24.—Chip of steel seen with ophthalmoscope in retina surrounded by a small hemorrhage. Foreign body loosened but not attracted by magnet; fresh hemorrhage followed. No irritation. V = $\frac{20}{200}$.

Harvey Garrison, æt. twenty, Wilkesbarre, Pa. Admitted

December 9, 1899. The same day a piece of steel had entered right eye at the outer-upper portion of sclera. The foreign body was seen glistening between macula lutea and optic disk; small hemorrhage below and temporal from it. Several times the tip of the magnet was placed to the cornea and no reaction or pain was felt; decided pain when placed on caruncle; after that trial a fresh hemorrhage was seen near the foreign body, the latter not having changed its position. At the place where it had been the day before, there were noticed by the ophthalmoscope a blood-clot and, extending from its lower border, a streak of coagulated blood crossing to the temporal side of the disk. The hemorrhage is subretinal, the retinal vessels being recognized as crossing over it. Temporal portion of the fundus hazy; in lower part of vitreous streaks of blood. Scotoma about forty-five degrees above the median line, twice the size of the blind spot. Four days later fundus was clearer, but foreign body was not seen again. V = $\frac{20}{30}$. The eye being quiet, no further trials made with magnet. Discharged December 14th.

Case 35.—Long piece of iron entered eye through sclera six hours ago. Section at limbus; iridectomy; foreign body extracted with Haab's magnet. Hemorrhage into vitreous, and detachment of the retina. Counts fingers.

David Foster, æt. twenty-two, New London, Ct.

Eye struck with chip of iron six hours previous to admission on October 12, 1901. Ophthalmoscope revealed a patch of hemorrhage below the disk. V = $\frac{20}{200}$. Field contracted at upper and inner part. Sideroscope indicated presence of iron. At first trial with Haab's magnet foreign body presented itself at lower portion of iris. A small opening made at limbus with bent keratome and enlarged by Stevens scissors, then piece of iron drawn out by magnet, a small piece of iris prolapsing, which was cut off. Anterior chamber and vitreous full of blood, so that the patient could not see anything. Original wound in sclera below and to outside of cornea. Foreign body is a large, somewhat curved, three-sided chip of iron, *9mm* in length, 1 to *2mm* thick. Eye improved during the following days; could count fingers; field defective at inner and upper part of periphery. November 8th, a large hemorrhage near optic disk and a central detachment of the retina were noticed. Patient left November 27th, his eye being in good condition; he was able to see well except directly in front; central detachment of retina still present.

Case 36.—Piece of steel seen sticking in retina. Another physician enlarged the original scleral wound and tried magnet in vain. Haab's magnet unsuccessful during three days. Infection of wound and globe. Enucleation.

George G. Hopkins, æt. twenty-five, Brooklyn; January 6, 1902, while hammering, the left eye was pierced by a piece of steel through sclerotic, about half way between limbus corneæ and canthus internus. No blood escaped. Patient felt no pain, but saw two big black spots before his eye, and every object looked at appeared hazy. Physician in Brooklyn noticed the presence of a piece of steel in the vitreous. He enlarged the original scleral wound, introduced the tip of a small magnet, but failed to attract the foreign body. Patient came to the "Institute" the next day. Small wound was found as described above, pupil fully dilated, blood at the bottom of vitreous chamber, extensive detachment of retina. At upper and inner part of retina was seen a bright-shining piece of metal with very irregular borders sticking in the tissue. At the nasal side of the foreign body was a rent in the retina about 1.5 P.D. in length, 0.5 P.D. in width, and filled with blood. Sideroscope furnishes no evidence of the presence of steel in the eye. Haab's magnet failed to dislodge it even after several attempts. Eye bandaged; patient put to bed. The next day upper lid slightly swollen; conjunctival congestion; scleral wound infected. Tn. Perception of light, except at extreme temporal border of field. Faint red fundus-reflex. Foreign body seen in front of detached retina. The use of Haab's magnet did not cause any pain, but as it did not move the foreign body patient was placed in bed again. January 9th, trial with magnet repeated, without result. Increased quantity of pus from wound. The following day pupil narrow, did not dilate under atropine; eye soft, iris discolored. Enucleation. Discharged January 16th.

Case 38.—Chip of steel entered through sclera; seen by ophthalmoscope; brought into anterior chamber by Haab's magnet; extracted through new corneal section. Recovery; perception of light.

R. J. Ryan, æt. thirty, New York. Was admitted January 15, 1902, piece of steel having entered through sclera. Foreign body seen indistinctly in upper and nasal side of vitreous chamber. Can see movement of the hand in upper portion of the field, which is contracted. Foreign body brought into anterior

chamber, where it fell to the bottom. Removed by large magnet through a fresh incision of cornea. During the following days corneal wound healed, eye became free from irritation; pupil was round, dilated under atropine. Sclera wound closed slowly; no loss of vitreous. Tn. No reflex from fundus. S = $\frac{1}{\infty}$ when discharged on January 26th.

CASE 41.—Piece of steel entered through cornea and iris; was seen in vitreo through ophthalmoscope. Extracted nine days later through fresh corneal section; recovery; V = $\frac{20}{60}$.

J. E. Anton, æt. forty-three, Cincinnati, Ohio. While striking a chisel, on April 29, 1902, a small piece of iron entered left eye. Admitted May 8, 1902. Corneal wound in centre of the lower and temporal quadrant, *2mm* from limbus; wound in iris patulous, $\frac{1}{2}$*mm* in width and *2mm* in length. Has suffered but little pain, of intermittent character. Eye moderately congested, pupil well dilated and round, fundus reflex good, opacities of vitreous to the lower and temporal side. Details of fundus and the foreign body can be seen, the latter suspended in vitreo, not far from retina. V = $\frac{20}{60}$.

Operation, April 29th.—The foreign body was drawn through the pupil with Haab's magnet. It lodged in the corneo-iridic angle; section with keratome downward and upward. Foreign body extracted. Piece of steel $2\frac{3}{4}$*mm* long and *1mm* wide. The next day an anterior synechia was seen, which disappeared during the following days, when tension was normal. Pupil well dilated, so that a small opacity of the peripheric area of the lens was noticed. Recovery. On discharge, May 25, 1902, field normal. Tn. Opacity of the lens did not increase. V = $\frac{20}{60}$.

CASE 43.—Chip of steel, after entering eye twelve days previous to admission, was seen with ophthalmoscope. During nine days unsuccessful attempts with magnet. Foreign body not found. Iritis; recovery; sight improving,

William Reich, æt. forty-four, New York. Twelve days ago, while striking a rusty hook, left eye was hit by something. Eye red and painful ever since. On admission, June 11, 1902, eye considerably congested; pupil moderately dilated. Tn. V = $\frac{10}{200}$. Not mentioned where foreign body entered, but it seems as if it found its way through cornea and iris, as iritis followed. Ophthalmoscope showed opacities in vitreous and foreign body lying just below the disk. Large magnet was tried unsuccessfully every day during the following week, while symptoms of iritis

became more pronounced and sight diminished to V = $\frac{4}{200}$. June 20th, the last attempt made with magnet in presence of Professor Haab, who happened to be in New York, but without result; slow recovery. V = $\frac{12}{200}$ when patient left July 7, 1902.

CASE 58.—Chip of steel entered ten days ago, seen in vitreous; iritis; unsuccessful trials with magnet during two weeks. Recovery. V=$\frac{15}{200}$.

F. L. Salisbury, æt. twenty-four, Bowling Green, Ky. L eye struck by a piece of steel ten days ago. Admitted August 20, 1903. Small scar, a trifle temporally to centre of cornea; anterior chamber hazy, slight iritis; circumscribed central opacity of the lens made fundus appear indistinct. V = $\frac{5}{200}$. Sideroscope showed no motion. Magnet caused pain when approached to lower nasal portion of the cornea. No result from the magnet the next day. Had atropine every two hours, pupil became fully dilated, and anterior chamber clearer. August 22d, trial with magnet repeated. When patient is looking as far down as possible, in the lower periphery of the fundus a white reflection appears, resembling a choroidal atrophy, in size larger than the disk, and in its location slightly nasal to median line. In a certain position metallic reflex from the spot described. During the following week the magnet was tried repeatedly and always in vain. It caused severe pain, though no bulging of either sclera or iris was noticed. Fundus cleared up; in the lower portion of the white area there was a perceptibly darker, somewhat grayish reflex, supposed to be the piece of steel. August 30th, same condition; last attempt made by magnet, painful and resultless. When patient left, on September 16th, the eye was free from congestion, pupil fully dilated. Cataract increasing downward and nasally in the posterior portion of the lens. Details of fundus no longer visible. S = $\frac{15}{200}$.

Though in the nine cases of this group the foreign body was seen in the vitreous, the magnet failed to extract it in four of them. In one case the eye was taken out for panophthalmitis, resulting from the infected foreign body (Case 36). The presence of the chip of metal was shown by the ophthalmoscope, while the sideroscope failed to indicate it and the magnet to extract it.

The three other cases, where the magnet was applied unsuccessfully, show better features. One (24) came the

same day; the media being clear, the foreign body could be seen in the retina, surrounded by a hemorrhage. Under control of the ophthalmoscope the magnet was applied, the chip became loose, and a fresh hemorrhage occurred. The foreign body changed its location, could not be seen four days later, and did not produce any irritation. The eye became quiet. $V = \frac{20}{20}$.

Cases 43 and 58 are similar, in so far as during one or two weeks the magnet, when applied at certain spots of the surface of the eye, caused considerable pain, but did not bring the chip to a position whence it could have been extracted. Both eyes developed iritis, which was cured, and in neither was the attempt made to remove the steel through a fresh scleral incision, as the irritation diminished. Sight was moderate ($\frac{10}{200}$ and $\frac{15}{200}$), but in either case improvement was to be expected after removal of the cataract in one, and after the absorption of opacities in the vitreous of the other.

Of the remaining five cases, one (41) acquired good sight ($\frac{20}{30}$), while in four the shape of the eye could be preserved, and later improvement of the sight could be expected, when the existing cataract or hemorrhage in the vitreous had received the proper treatment.

Case 22 may be specially mentioned, because of the successful result, in spite of the fact that the foreign body had been imbedded in an exudation of the retina when patient was admitted, and the operation was made a full week after the injury. It seems as if the success of the magnet in the cases of this group depended somewhat on the size of the chip; the larger chips could be removed, the smaller ones were lost in the vitreous.

Cases 20, 22, 35, 41, show pieces of 3 x 1.5, 8 x 2, 9 x 2, 2.75 x 1*mm*; the size of the particle removed from Case 38 is not mentioned, but was certainly not very small, as the hard sclera had been penetrated. The pieces seen in the vitreous of the unsuccessful cases, 24, 43, 58, were apparently smaller. In Case 36, the size of the foreign body is doubtful. The sclera had been penetrated, and the history stated that a "particle of metal with very irregular borders

and sticking in the tissue" had been shown by the ophthalmoscope. Unfortunately no pathological history is at hand; it seems, however, as if in this case a larger piece of steel entered the eye, became fixed in its posterior wall, and consequently resisted the attractive power of the magnet.

(*To be continued.*)

SOME INJURIES TO THE EYE FOLLOWING SUBCONJUNCTIVAL INJECTION OF SALT SOLUTION.

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SUBCONJUNCTIVAL injections of bichloride, which were introduced into eye-practice by Reymond, Secondi, and Darier, were, as is well known, soon employed in the most diverse forms of eye-disease, and described in many reports as unusually efficacious. However, as is usually the case with new methods and new therapeutic agents, in a short while the enthusiasm died out, and finally it was discovered that not only were there many cases in which no results were attained, but a large proportion in which decided injurious effects were observed. It is unnecessary for me to go over the extensive literature on this subject here; suffice it to mention that, among German authors, it was especially Mellinger (1) and his pupils who studied this question, and who called attention to the dangers and injuries to the eye attendant upon subconjunctival injections of bichloride. It is chiefly owing to their labors that the operation of subconjunctival injections of bichloride (at least in Germany) has been largely abandoned.

The three important points scored against the above-mentioned method, by the Basel school, were as follows:

1. It was shown that subconjunctival injections of bichloride were often badly borne. Eyes which were thus treated often remained in an irritable condition after complete cure of the condition for which treatment was instituted.

"There is no longer a characteristic congestion of the eye. However, there are photophobia and excessive lachrymation. The bulbar conjunctiva, especially at the points of injection, is noticeably thickened, a pale dirty red, and of jelly-like consistence. Sensation is diminished at these points. Marti, in his Basel dissertation, mentions a case in which, after two subconjunctival injections, consisting each of one minim of a bichloride solution (1:2000) with $\frac{1}{10}$ % NaCl, a necrotic patch, containing no vessels, *4mm* long and *2mm* broad, appeared. After six weeks it disappeared, leaving a dull white area."

Furthermore, there were noticed adhesions between the bulbar conjunctiva and the sclera at the points of injection, so that it was impossible to make a cocaine injection in these areas. "In the enucleation of two eyes, it was impossible to dissect off the conjunctiva in these places. A microscopic examination showed these portions of the conjunctiva to have a peculiar, homogeneous yellowish appearance, with larger and smaller hemorrhages. The deeper parts, which showed considerable infiltration, were firmly united to the underlying sclera. The blood-vessels were very much dilated, and embedded in firm connective tissue" (Mellinger).

2. There has been no positive proof that in subconjunctival injections the bichloride reaches the interior of the eye, to act there as a disinfecting agent. Many experiments, described by me in another paper (2), militate against this view.

3. Numerous observations on the eyes of the lower animals and of the human being showed that bichloride acts upon the energy of the lymph-currents only in its capacity as a salt "by exciting currents of diffusion, which are, however, very slight, since the larger part of the bichloride is changed into an insoluble albuminate of mercury in the tissues" [Pichler (3)]. If bichloride is effective only in this way, we have a much more valuable agent in common salt, which, as Heidenhein showed, is an excellent lymphagogue.

These facts caused Mellinger to substitute for the bichloride injections subconjunctival injections of NaCl. This procedure was first recommended by Rothmund (4) in 1866,

but had since fallen into oblivion. In a large number of papers, the Basel clinic has since demonstrated that the subconjunctival injection of common salt is an extremely efficacious therapeutic agent (Mellinger, Marti, Schiess-Gemuseus, Wehrle, Zehender, Burri). Two per cent. solutions were used in diseases of the cornea, and 4 % and 10 % solutions in diseases of the interior, as choroiditis, diseases of the vitreous, and detachment of the retina. The entire contents of a Pravaz syringe were used. When smaller quantities were used, the results were less marked (Mellinger). According to Burri (5) and Mellinger, the method has no disadvantages. "There is no pain when a few drops of a 2 % cocaine solution are used in the conjunctiva, and the slight irritation of the conjunctiva always disappears in a short time. After 40 to 60 injections, the bulbar conjunctiva becomes inflamed and painful, but this rapidly disappears when the injections are stopped. Adhesions never form between conjunctiva and sclera. Even after extensive use, gangrenous patches have never appeared, as was sometimes observed after the use of bichloride." As a rule, the injections can be repeated daily, and only in rare cases do slight conjunctival irritation and ecchymoses necessitate their stoppage for a time.

The observations of the Basel clinic have since then been confirmed by a large number of writers. Even in those cases where more concentrated solutions were used [Dor (6) and Bourgeois (7) used 20–33 per cent. solutions successfully], the eye showed no ill-effects. That there are exceptions to this rule, however, even when solutions of ordinary strength are used, is evidenced by three cases which I have seen, and which I therefore consider worthy of a detailed description. The third case was seen by my colleague, Dr. Neuburger, for whose kindness in sending me this case, and allowing me to use it here, I tender my sincerest thanks.

Case 1.—The eighteen-year-old servant girl, N., came to my office in November, 1902, on account of poor vision. There are diffuse opacities in the deeper layers of both corneæ. No inflammatory symptoms. A long time ago she was treated in the Erlangen University clinic, where she received many injections

of NaCl. I placed a small quantity of dionin powder on the conjunctiva. Instead of the intense chemosis which normally follows this procedure, the bulbar conjunctiva became only slightly œdematous, and numerous white linear scars appeared upon the reddened background, showing where the conjunctiva was adherent to the sclera.

From Professor Oeller I received the following information: "I treated the patient N. about one half year for a severe interstitial keratitis of both eyes. She received subconjunctival injections of NaCl on both sides. The strength of the solutions is not noted, but I think she received the strength ordinarily used in the clinic, 2½–5 %." Professor Oeller adds that he has used NaCl injections in a large number of cases, but seldom stronger than 5 %. However, even with 10 % and 20 % solutions he has never had a serious complication.

To recapitulate, this case showed, after a large number of injections of 2½–5 % NaCl solutions, the same adhesions between conjunctiva and sclera which occur when bichloride is used. This was demonstrated by the use of dionin in the conjunctival sac.

The injuries were more serious in the two following cases.

Case 2.—The merchant L., age twenty-nine, was sent to me by his family physician in the middle of April, 1904. The patient, a very nervous man, complained for some time of foggy vision in the right eye, which is also inflamed. With the left eye he has seen poorly for a number of years. The eye has squinted since that time. The disturbances in the right eye are similar to those which he noticed when the trouble began in the left eye. Present condition: The left eye shows no inflammatory signs. It is turned outward and upward. Fingers, at six feet, are recognized only in the peripheral part of the field. There are numerous atrophic patches in the choroid, some bordered by pigment. A patch, the size of the disk, is seen at the macula. This causes a large central scotoma. The right eye shows slight pericorneal injection. Under the lower part of the limbus there is a circumscribed portion which is more strongly injected. The dark tone indicates intraocular disease. There are fine diffuse opacities in

the vitreous, also a few shreds. In the periphery, low down, there are five recent choroidal patches, the largest of which is the size of the head of a pin.

Vision = $\frac{6}{12}$; with + 0.5 cyl. axis vert., $\frac{6}{6}$. Reads Nieden type 0.4 at 30*cm.*

There is nothing to indicate syphilis or tuberculosis. The patient says that he was myopic as a child, and received the following distance glasses from an oculist fifteen years ago:

R — 6 D sph. ⌒ — 3 D cyl. axis horiz.
L — 2.5 D sph. ⌒ — 2.5 cyl. axis horiz.

Four years ago he received at the University clinic — D sph. for both eyes. At the last examination, August 27th, he sees $\frac{6}{6}$ with + 0.5 cyl. axis vert. (The ophthalmoscope shows the vertical meridian to be emmetropic, the horizontal to have 1–2 D of hyperopia.) The disappearance of so high a degree of myopia is remarkable.

I ordered at first aspirin and diaphoresis, and later KI and inunctions with ung. ciner., and locally, atropine, warm compresses, and smoked glasses. The patient complained of nervous disturbances, so that the inunctions and KI had to be stopped. On May 8th, under cocaine anæsthesia, I injected the contents of a Pravaz syringe of a 5 % NaCl solution, which was well borne. The irritation disappeared on the next day. As there was some subjective improvement, I repeated the injection the following week, using this time a 10 % solution, which was of course carefully sterilized. About five hours later, I was called to the patient's house, where I found him considerably excited and complaining of severe pain in the eye and head. I removed the moist compress, and found nothing outside of the artificial injection and swelling. I ordered cold compresses and antipyrin.

On the following day, the patient complained of severe pain in the eye. The signs of irritation, which I ascribed the evening before to the injection, had not disappeared. The bulbar conjunctiva was, on the contrary, more inflamed. There were photophobia and lachrymation. In the course of that and the next day, the symptoms became more severe.

On May 19th (four days after the injection), the lower part of the bulbar conjunctiva was chemotic; there was a large dirty-blue area, which indicated a coming gangrene. To relieve the pressure symptoms, I made numerous small incisions into the conjunctiva with the scissors, and noticed that the conjunctiva was

infiltrated and like a mass of jelly. The discoloration increased, and on the 21st a portion of the conjunctiva, 5 x 13*mm*, was necrotic. The upper border of the gangrenous patch reached to the lower part of the limbus corneæ. On the next day the patient complained that his sight was getting worse. It was seen that the lower third of the cornea, which was adjacent to the necrotic conjunctiva, was stippled in appearance. The mirror reflex was uneven, but there was no loss of substance. Fluorescin showed, in this region, numerous small green dots, which seemed to be subepithelial. I applied a wet compress. Next day the pain abated somewhat, but vision was worse. V = $\frac{6}{60}$—$\frac{6}{36}$. The cornea looked somewhat better. Under complete mydriasis, I saw, by oblique illumination, that peculiar irregular reflex on the lens which is the forerunner of cataract. On examining with a strong lens (+ 11 D), I discovered two linear opacities in the anterior part of the lens (perhaps folds of the capsule). The lower line was horizontal, and the upper slightly oblique. The vitreous was clearer; it seemed, therefore, to have reacted well to the salt injection. Contrary to my expectation, the condition improved considerably in the next few days. The subjective symptoms improved; on the 26th, the cornea was normal, and on the 28th the changes in the lens had disappeared. Vision was $\frac{6}{6}$ with + 0.50 cyl. axis vert. The necrotic portion of the bulbar conjunctiva had meanwhile separated, and the defect healed with scar-formation. The present condition (August, 1903) is as follows: Bulbar conjunctiva is slightly reddened and shows a few linear cicatrices. Cornea and lens normal. The vitreous contains a few fine opacities. In the peripheral part of the choroid, low down, there are several atrophic patches. No new patches. Vision, with + 0.5 cyl. axis vert., is $\frac{6}{6}$. No more subconjunctival injections were made in this patient.

In this case, the subconjunctival injection of 1*gm* of a 10 % NaCl solution did considerable damage. It led to extensive necrosis of the bulbar conjunctiva, and gave rise to peculiar changes in the cornea and lens, which luckily passed away in a short time. The latter changes were also seen in the following case, which my colleague, Dr. Neuburger, observed here, and had the kindness to place at my disposal.

Case 3.—Woman, fifty-three years old. Subconjunctival injec-

tions of a 5 % NaCl solution, with the addition of acoin, were made, for a myopic detachment of the retina. The first ones were well borne. After the fourth, sixth, eighth, and ninth injections, opacities of a peculiar kind were seen, like the microscopical contours of steam, with a network of fibres in places. This was best seen with a strong lens (+ 10 D). The cornea also showed opacities. With oblique illumination, the anterior surface of the cornea had a stippled appearance. These observations were made on the third to fourth day after each injection. About eight days after the injection, the changes disappeared. When the compress was taken off earlier, the changes in the cornea also disappeared sooner.

In this case, therefore, the operation had similar results to those observed in my case. It is especially noteworthy that in Neuburger's case the picture was repeated several times. He used only 5 % NaCl solutions, with the addition of acoin. (The latter substance could not be held responsible for the trouble, as I had not used acoin. I had added two drops of a 3 % cocaine solution to the NaCl.)

The changes in the cornea were similar to those seen in my patient,—the same changed reflections of the cornea, which appeared stippled, without a defect in the epithelium. Since the cornea returned to the normal more rapidly when the compress was removed earlier, one might suspect that the changes were caused by the compress. This, however, is not possible, since my patient did not receive his compress until the corneal changes had already appeared, and I feared that it might lead to an ulcerative keratitis. It is my opinion that, in Neuburger's as in my own case, there were disturbances of nutrition in the corneal epithelium, which, luckily, were not so extensive as to cause a lasting injury to the superficial layers of the cornea. Perhaps the condition was due to a hyaline exudation, which was reabsorbed in a few days. At first I considered the corneal condition to be the result of the extensive destruction of the conjunctiva, but this view was shown to be incorrect, since in Case 3, with a normal conjunctiva, the corneal changes appeared repeatedly. We must, therefore, look on these changes as the direct result of the NaCl injections. The affection of

the lens, which I first discovered on the seventh day after the injection, is of especial interest. I was unable to make a careful ophthalmoscopic examination until that day, on account of the extreme irritability of the eye. As the changes were already very extensive when I first saw them, it is very likely that the process had started several days before. Neuburger saw the changes in his case, three to four days after the injection. On examining with a strong lens, I gained the impression as if there were folds in the lens capsule. From day to day, I could follow the improvement of the condition, this improvement being accompanied by a corresponding improvement in the vision. On the thirteenth day after the injection, the lens appeared normal. Since the changes here were only temporary, we can assume that here also, as in the case of the corneal changes, we had to deal with exudations which were afterwards absorbed.

In the patient L. (Case 2), the bulbar conjunctiva was the first to become affected, whereas in Neuburger's case it remained intact. On the fourth day after the injection, I noticed the beginning necrosis, which, in its further course, led to a large loss of substance. This healed later by cicatrization.

To sum up, we saw that 5–10 % subconjunctival injections of salt solution were followed by various injuries to the eye. Not only adhesions between bulbar conjunctiva and sclera, and partial gangrene of the conjunctiva (complications which were seen to follow bichloride injections), but also transient changes in the cornea and lens.

I have seen no similar reports in the literature. As I have quoted from the opinions of Burri and Mellinger, it is emphatically stated that no injuries follow this procedure. Pichler, in his critical collective report on medicinal therapy in ophthalmology, recommends the use of subconjunctival injections of salt solution, with the words: "It is a healing agent, and no poison, which we give here." This opinion is endorsed by every ophthalmologist. Yet our cases show that this healing agent may show some very unpleasant side-effects, even when the solutions do not exceed 10 % in strength. Perhaps we will soon hear more on this

question from other sources. It will perhaps be decided in the future, whether salt solutions cannot be entirely replaced by aqua destillata. Pagenstecher (8) saw the same results follow the use of aqua destillata, especially in cases of purulent corneal ulcer, as with injections of NaCl solutions.

Ohlemann (9) has recently called attention to a very simple substitute. It is well known that dionin, which has been playing an important rôle in ophthalmology in the last few years, when placed in the conjunctival sac, possesses the interesting property of causing an intense chemosis, as an expression of lymph-stasis. "We shall soon see whether it is more efficient than subconjunctival injections or not. At any rate, this agent has the advantage of being much easier of application; although both methods produce the same results, namely, a chemosis, one through lymph-stasis and the other through injection of a fluid, we should conclude *a priori* that the more natural lymph-stasis would bring about the more rational method of absorption." In my opinion, the dionin method cannot have the same value as injections, since the eye soon becomes accustomed to the dionin, and the desired reaction, namely, chemosis, can only be obtained after a long interval of rest, whereas the injections can be repeated every two or three days, if the signs of irritation disappear rapidly. Perhaps some new preparation will soon be placed at our disposal, which will serve better in this regard than dionin.

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ARE THE ANOMALOUS TRICHROMATES FIT FOR SERVICE ON RAILROADS?

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Translated from the German Edition, May, 1904, by Dr. Matthias Lanckton Foster.

THE studies of the deficiencies of the color-sense have revealed in addition to the two known types of dichromates, the deuteranopes and protanopes,[1] the existence of two similar anomalous trichromatic systems. Lord Rayleigh examined 23 persons, and found 5 of the first type and 2 of the second among them. Donders selected 60 persons who were not color-blind and found 4 anomalies of the first type. In the same way A. Koenig found 3 out of 70 selected cases, and von Kries 1 out of 20, all of the first type, while Levy has recently confirmed and studied the second type described by Rayleigh, which had remained neglected and forgotten since his time. Thus we see that, aside from Rayleigh's observations, in which the subjects were not selected, 8 out of 150 trichromates, 5⅓ %, belonged to the first type. It may be assumed that the second, apparently rarer, type will be observed more frequently in the future now that attention has been called to its characteristic by Levy.

The question for our consideration is, to what extent these

[1] A person who possesses the three fundamental color-perceptions according to the Helmholtz theory—red, green, and violet—is said to be trichromatic; if perception of one color is wanting (partial color-blindness), he is said to be dichromatic. According to v. Kries's nomenclature, one who is red-blind is called a protanope, one who is green-blind a deuteranope, and one who is violet-blind a tritanope.—W. A. H.

anomalies are injurious in business life, particularly whether they render their subjects unfit for service on railroads or on the sea. I have followed the method of Donders to determine the exactness of the color-sense by means of the smallest visual angle in which the specific characteristics of a color can be recognized. This method complies with the simplest form of the demands of the service, that a colored signal of a given size must be recognized at a certain distance. It also furnishes the opportunity to determine mathematically the power of recognition for any single color, and so permits the comparison of the results obtained in the examination of normal and abnormal trichromates.

Much uncertainty is attached to this method. It requires a great deal of practice to specifically recognize a color with a very small visual angle, and therefore the result obtained is a measure not simply of the color-sense, but also of the talent for observation, which improves during the investigation even in persons accustomed to make minute observations. In addition, the eye becomes wearied quickly and contrast colors appear on prolonged fixation. Furthermore, the conditions are not equally favorable for the recognition of different colors. Some appear luminous at a greater distance than that at which they appear colored, and the eye is already fixed on the point to be observed when the specific color is perceived ; others appear colored at the moment when they are seen. Some also are easily perceptible by peripheral vision, while others can be recognized only with the central. The latter is peculiarly the case with red, which is not recognized until, as the visual angle is increasing, the red light happens to fall on the macula, but then while it is held firmly fixed by the eye the light may be carried three or four times as far away without loss of the specific impression. Still further, even when the colors have been selected so as to have their clearness as nearly equal as possible, there remain peculiarities which suffice to permit the recognition of the individual color tests. For these reasons this demonstration was conducted so as to rely on the judgment of the observer to determine when he believed he saw the specific color. For example, when it had approached

beyond the specific limit, he had the color carried back until he believed he had found the limit. Reliance was therefore placed on the conscientiousness of the observation in a manner that could not be followed in most observations, least of all in investigations regarding fitness for service. But with a few very skilful associates I was enabled thus to obtain reliable figures valuable for comparison. A thorough study was made of only two normal and two abnormal trichromates, one of the latter of which belonged to the first, the other to the second type. All four were skilled observers, and their skill had been increased by previous attempts until a sufficient certainty had been attained to make the results of value.

A ten-candle power ground-glass incandescent light was placed in a wooden box from which all other light was excluded. In the front of the box was an aperture holding a disk of milky-white glass to render the transmitted light very diffuse. In front of this was a black metal plate with two movable circular disks, one in front and one behind. The anterior one had five apertures measuring 20, 10, 5, 2.5, and 1.25*mm* in diameter; the posterior one five apertures each 20*mm* in diameter, in which were inserted five glasses, white, red, green, blue, and yellow, as nearly equal in clearness as possible. The examination was conducted in a dark room ten metres long. As has been stated, the finer determination of the liminal value is obtained through variations of distance. As this could be combined with variations in the size of the aperture, a very extensive total variation could be obtained, together with the power to control the accuracy of the statements. At first all, or a number, of the apertures were used, and the fact was demonstrated that a doubled distance of the limit of perception corresponds to the doubled diameter of the aperture. In the results therefore the quotient $\frac{D}{a}$ $\left(\frac{\text{Distance}}{\text{aperture}}\right)$ alone is given, and this is a definite measure of the visual angle, or of the stimulated surface of the retina. $\frac{D}{a} = \frac{1m}{1cm}$ is taken as unity, hence a visual angle of less than 40°. This unit was chosen quite arbitrarily because of its convenience in calculation and does not indicate the normal limit as it does in the determination

of visual acuteness. White is inserted as a confusion test, and is necessary because unless the possibility of this mistake is present the most conscientious observer can never be quite positive whether he truly perceived the specific color of yellow or distinguished it from the others by the absence of color. It should be noted that it makes a great difference whether the demand is for a specific color perception alone, or for a differential separation of similar colors from each other. In the latter case green and blue are more difficult to distinguish from each other than are red and yellow. Hence a distinction between green and blue was not required, but the answer green or blue sufficed. The simultaneous use of green and blue as signal colors in practical work is excluded, while either serves as a contrast to red.

In order to approximate the conditions of practical work as nearly as possible, the duration of the observation was left to the inclination of the observer and not restricted to a fixed period. Wittich has shown that the determination of color is possible with a smaller visual angle when fixation is prolonged than when it is momentary, therefore a slight motion, so rapid as to produce only a single impression, was imparted to the object so as to cause its image to glide over all parts of the macula during fixation. But it must be remembered that in prolonged fixation antagonistic colors appear and abolish the specific perception. Hence there is a length of time which is best for the observation of each color perception and this the observer learned for himself.

Donders gives the formula $\left(\frac{1}{m}, \frac{d}{D}, \frac{a}{A}\right)^2$ as a measure for the power of distinguishing colors. In this formula m denotes the diameter of the aperture, d the distance at which the observer has recognized the color, D the distance at which it should be recognized, a the remoteness of the source of light behind the aperture, A the remoteness of the light requisite for recognition by those competent to recognize the color. In my experiments the remoteness of the source of light was a constant quantity, so the quotient $\frac{a}{A}$ disappears as a factor, and as D, the distance at which the normal eye would recognize the color, must also be con-

sidered constant the power of distinguishing colors becomes represented by $(\frac{d}{m})^2$, or by the formula given above $(\frac{D}{a})^2$, while the visual power can be calculated from the well-known formula $\frac{d}{m}$. Therefore the results gathered in the following tables must first be squared. Each figure specifies the average of ten liminal determinations. The influence exerted by smoke, fog, and clouds on the specific perceptions of color is demonstrated by the interposition of a ground glass (Ma), three milky-white glasses of different degrees of translucency (M_1, M_2, M_3), and two smoked glasses of different degrees of translucency (R_1, R_2).

DR. F., NORMAL TRICHROMATE.

		Ma	M_1	M_2	M_3	R_1	R_2
Red	1.7	2	0.8	0.6	0.3	2	0.8
Green	1.8	2	1	1	0.6	2	0.9
Yellow	9.	4.8	3.4	2.6	1	3.4	1

DR. L., NORMAL TRICHROMATE.

		Ma	M_1	M_2	M_3	R_1	R_2
Red	1.7	2.4	0.8	0.7	Not tested.	2.4	Not tested.
Green	2.5	2.4	1	1.5		2.3	
Yellow	6.8	6.	2.6	2.5		3	

DR. GUTTMANN, ABNORMAL TRICHROMATE, TYPE I.

		Ma	M_1	M_2	M_3	R_1	R_2
Red	1.5	0.6	0.2	0.15	0	0.8	0.03
Green	1.5	1.3	0	0	0	0.05	0.03
Yellow	6	2	1.2	0.4	0.06	4	1.5

DR. LEVY, ABNORMAL TRICHROMATE, TYPE II.

		Ma	M_1	M_2	M_3	R_1	R_2
Red	0.3	0.25	0.02	0	0	0.1	0
Green	1.2	0.6	0.2	0.075	0	0.8	0.1
Yellow	1.8	0.9	0.25	.02	0	0.6	0.15

These results which I obtained in the normal cases are not exactly parallel to those obtained by Aubert and Wittich who made investigations along the same line. Neither these authors nor I tested with spectral colors, because such a test would not be useful from the practical point of view, and therefore it is probable that the tone of the pigment colors used in the tests was not quite the same. In order to render the yellow of about the same brightness as the other colors I had to darken it by placing several yellow glasses over each other and then add smoked glasses. This combination gave a brownish character which readily evoked the specific impression of yellow when it was contrasted with a colorless light. Other incommensurable factors are the different saturations and the never absolute equality of the clearness of the colors. The condition of adaptation of the eyes also plays a part, but this should not be rated too high in this case where dependence was placed on the foveal region alone. The possibility that the degree of adaptation would become too great through a prolonged stay in a dark room was always guarded against by lighting the room after each separate test.

We can therefore make comparisons which are free from objection only between the results obtained under the same conditions in the two normal cases, and these agree with each other very well. The subnormal appreciation of the first type of abnormal trichromates for green and of the second type for red is also evident. The chance that an abnormal trichromate will recognize a color correctly is influenced unfavorably by a diminution of its clearness as well as by a reduction of the visual angle. In the first type the liminal value for green is only slightly less than in the normal and only to the same degree as for yellow and red, but if the intensity of the light is lowered by the interposition of a slightly milky (M) or a slightly smoked (R) glass, which in the normal necessitates simply a little larger visual angle, the abnormal is either unable to distinguish the color, or is able to do so only by means of a very large visual angle.

The second type, as represented by Dr. Levy, shows a

markedly subnormal appreciation of red, which increases as the brightness of the light is lowered.

Through the kindness of Professor Nagel I was enabled to use as tests also the green and red signal disks which are used at the present time on railroads. These were illuminated by oil lamps placed behind them. I obtained the following results:

	Normal	Abnormal Type I.	Abnormal Type II.
Red	8	1.3	0.6
Green	7	3	1.7

Both of these colors could be recognized at a much greater distance than those which I had chosen, and the sub-perception of the abnormal is not only also evident, but it impresses itself even more strongly. The question whether this subnormal appreciation renders a person unserviceable for work on a railroad can be answered only with regard to each individual case, because there are great differences between the individual abnormal trichromates. As a preliminary it must be determined with certainty what is the minimum power of color distinction necessary for railroad service. This minimum has been accurately determined regarding visual acuteness on the basis that the arm of a signal post can be recognized in cloudy weather at the distance of at least 1000 metres, which corresponds to a vision of $\frac{2}{3}$. No such determination of the power to distinguish colors has been made, it may be because too many variable and incommensurable factors need to be taken into consideration. But as the colored signal lanterns, which at night take the place of the signal arms, have apertures measuring 15*cm* in diameter and must be recognized at the same distance, 1000 metres, an ability to distinguish colors of 6.7 is necessary, according to the calculations we have given above. Even though the abnormal trichromates may be able usually to guard against mistakes in practical work by the recognition of colors through secondary distinguishing

marks in the same manner as dichromates, yet after it has once been officially acknowledged that a good power of distinguishing colors is a preliminary requisite of those who seek service it will be concluded that these two abnormal types do not meet the demand.

In conclusion, I wish to thank Professor Nagel, who suggested this investigation to me, and furnished all the necessary apparatus, and the gentlemen who have supported me faithfully in these tedious and wearying tests.

HÆMOLYTIC INJECTIONS FOR RECURRENT HEMORRHAGES INTO THE VITREOUS.

By Professor ELSCHNIG, Vienna.

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AT the thirty-first meeting of the Ophthalmological Society of Heidelberg, in 1903, Roemer demonstrated that an almost immediate disappearance of blood from the vitreous of rabbits' eyes could be brought about by the injection of serum obtained from guinea-pigs, hæmolytic for rabbits' blood. As the operation is harmless when performed with modern asepsis, he recommended that it be tried in hæmophthalmos.

Some months later I was enabled to try this method on a diseased human eye, and, although the result was bad, I publish the case as the first one, to the best of my knowledge, in which the attempt has been made.

R. A., thirty-four years old, consulted me December 18, 1903. In February, 1903, while suffering apparently from a cold in the head, he suddenly noticed a black spot in the field of his left eye. It moved freely with the ocular movements, increased rapidly, and at the end of about four months he had only perception of light in that eye. In May of the same year his right eye became similarly affected, and after about three months he was almost totally blind.

There was no history of syphilis. The condition of the urine and of the blood was normal. The patient was of slight build and pale, but healthy. He had never had any severe illness, with the exception of children's diseases. A careful physical examination

revealed a slight thickening of the walls of the peripheral arteries and a slight arhythm of the heart's action. Both eyes were externally normal.

In the left eye, a dark red reflex could be obtained from deep in the vitreous with the ophthalmoscope. In the extreme periphery alone, the dark red mass of blood was changed into small balls, which moved with the motions of the eye and permitted the bright red fundus to be seen between them. In the upper periphery, whitish, reflecting membranes and cords could be seen between the hemorrhages. Below, the retina appeared to be detached. The tension was normal, the vision perception of light, the projection faulty above. In the right eye, the condition was the same except that no cords or membranes could be seen in the vitreous and that there were no signs of retinal detachment. There were good perception of light and normal projection.

As I considered the left eye lost in any event on account of the retinal detachment, I resolved to try upon it the hæmolytic serum, and did so December 22, 1903. Dr. Sternberg obtained for me some of the hæmolytic immune serum of rabbits used in the sero-therapeutic institute of Professor Paltauf in Vienna, tested it bacteriologically, and found it free from germs.

Under cocaine anæsthesia an incision was made in the lower temporal quadrant of the ocular conjunctiva, in the region of the ora serrata, perpendicular to the margin of the cornea. The upper lip of the wound was retracted, and a puncture made in the sclera at a little higher level, through which the needle of a hypodermatic syringe was passed into the deep part of the vitreous. Some bloody serous fluid was first withdrawn, and then about an equal quantity of the hæmolytic serum injected. A bandage was then applied. The entire operation was performed under the most rigorous asepsis.

During the afternoon of the same day there were a slight chemosis and much injection of the ocular conjunctiva with ciliary injection. The pupil was small and contained a delicate coagulum of fibrin. After the pupil had been dilated with atropine, a grayish reflex could be obtained from deep in the vitreous. No blood could be seen. The tension was slightly increased. No perception of form; projection uncertain.

During the following day, a severe plastic iritis developed, with great œdema and injection of the ocular conjunctiva, and a marked

ciliary injection which soon gave place to a sclerotic discoloration of the circumcorneal zone. The vision had fallen to uncertain perception of light. The iritis fluctuated in intensity, but the pupil could no longer be dilated; a slight hypopyon appeared, the tension was plus, and the pain was increasing. Treatment was of no avail. The cornea became hazy; the circumcorneal zone of the sclera began to become ectatic on January 12, 1904, the anterior chamber gradually became shallower; there were a gray appearance in the pupil, and complete blindness. The eye was enucleated January 18, 1904. The entire circumcorneal zone was so ectatic that the enucleated eyeball appeared to be pointed.

The eyeball was placed in formalin for forty-eight hours, and the upper third then cut off by an incision parallel to the horizontal meridian, and used for bacteriological examination. The rest of the globe was hardened still more, then embedded in celloidin, and cut into sections.

The search for bacteria was fruitless.

The histological condition was as follows. The epithelium of the cornea was changed inasmuch as the foot cells were irregularly cuboidal and the greater part of the middle layers scarcely distinguishable from the superficial. Leucocytes, nearly all mononuclear, were scattered between the epithelia. The formation of acantholytic vesicles could be seen only here and there.

In the central part of the parenchyma of the cornea there was only a slight increase of the normal cellular elements, with an occasional mono- or polynuclear round cell. In both the superficial and middle layers of the marginal portion there were lines of spindle-shaped and round cells, for the most part along little blood-vessels. There were numerous cells, both resembling the normal ones of the parenchyma and round ones with well stained round nuclei and large bodies of protoplasm which contained granules easily stained by eosin, particularly in the lines of cells already mentioned. In many places the parenchyma had a well-marked fibrillary appearance, while between and in the lamellæ were small spaces filled with finely granular masses scarcely stained by eosin. Coherent lines of red blood corpuscles penetrated into these spaces in the marginal portions. The endothelium

of Descemet's membrane was absent in places, and where present the cells were apparently smooth, the nuclei badly stained. Descemet's membrane was almost everywhere covered by a more or less thick layer of round cells, mingled with apparently swollen, badly stained endothelial cells and numerous red blood corpuscles. Toward the bottom of the anterior chamber there were large masses of coagulated albumin poor in cells on both the posterior surface of the cornea and the anterior surface of the iris.

The conjunctiva and episclera were much thickened, very rich in broad, thin-walled blood-vessels, between which the tissue was thickly permeated by polymorphous round cells, most of which were mononuclear plasma cells and cells easily stained by eosin, together with circumscribed areas of red blood corpuscles. In the circumcorneal zone this tissue merged with no distinct demarcation into the sclera, which was likewise infiltrated with round cells. The diffuse increase of nuclei diminished farther back in the sclera, but everywhere the vessels and nerves were closely surrounded by round cells.

The iris was pressed closely against the posterior surface of the cornea at its ciliary margin, its parenchyma was thickly permeated by round cells, almost exclusively mononuclear, which were particularly dense about the numerous dilated blood-vessels. Pigment cells and cells filled with granules easily stained by eosin were sparsely scattered Typical stroma cells could not be distinguished, but between the round cells were pale, spindle-shaped nuclei often in large bands and islands. The sphincter cells were in large measure undergoing hydropic fatty degeneration.

A tissue with many thin-walled dilated blood-vessels, which could be distinguished from that of the iris itself only by the scarcity of the young connective-tissue cells, extended over the pupillary margin and occluded the pupil. Toward the anterior chamber it was for the most part covered by a loose mass of coagulated albumin and round cells. Posteriorly it lay on the anterior capsule of the lens and extended between this and the iris in all directions to the ciliary body, enveloped the equator of the lens, and left only two-thirds of

its posterior surface free from this thin mantle of slightly vascular tissue. The ciliary processes were so involved in this young connective tissue that only islands and lines of epithelium showed their position and extent. So far as demonstrable, their tissue was densely infiltrated by round cells, their vessels very numerous and dilated. The neoplastic tissue then extended over the non-plicated part of the ciliary body, the epithelium of which was partly involved in this new tissue, partly absent, so that the pre-existing tissue presented numerous large and small circumscribed patches directly continuous with the new tissue with interchange of vessels. In the ora serrata the retina was involved in the new tissue. Toward the vitreous there was no clear line of demarcation, but delicate bands of spindle-shaped cells shot from it into the adjoining vitreous, which was densely infiltrated with round cells, mostly mononuclear. The vitreous had retained its structure best in the portion immediately adjoining the lens. Its fibrillation was very marked, but was fairly regular, and numerous well preserved vitreous cells, as well as cells easily stained by eosin, were demonstrable. Farther back were many large and small spaces separated by cellular bands resembling connective tissue and containing amorphous masses of albumin. Toward the ora there was an extensive region in which it consisted entirely of thick, almost colorless, swollen cell nuclei, near which again there were places which contained finely crumbled masses of broken-down, dark-colored nuclei. In several places, particularly near the retina, the vitreous was permeated with red blood corpuscles, which were for the most part disintegrated. The middle of the vitreous consisted of coagulated albumin extending laterally to the retina and penetrated by the cords already described, which were thicker where they joined the retina. Toward the papilla there were increasingly large collections of well preserved red blood corpuscles, and then the vitreous merged, with no distinct line of demarcation except when afforded by large collections of blood, into the neoplastic tissue which covered the papilla and retina.

The ciliary body and processes, so far as they were

preserved, were pressed flat, the ciliary muscle was reduced, the vessels were dilated and abundantly contained round cells in their adventitia. The epithelium was well preserved, but swollen in many places and penetrated by the irregular cells in the perilenticular connective-tissue. At the beginning of the non-plicated portion, the tissue of the ciliary body was densely infiltrated by round cells, and the epithelium in great part was broken through so that vessels and cell bands passed from the ciliary body into the neoplastic tissue of the vitreous. The adjoining choroid was likewise densely infiltrated as far as the optic nerve with round cells, almost all mononuclear, and transition forms in spindle-shaped elements, beneath which were numerous cells easily stained by eosin and resembling plasma cells. The suprachoroidea with the large- and medium-sized vessels was chiefly involved, while the choriocapillaris in general and the pigment epithelium were intact. In front of the equator alone, the choriocapillaris was defective in places, the lamina vitrea and the pigment epithelium were broken through, and a very cellular young connective-tissue arose out of the choroid. This was particularly marked in the lateral portions of the eyeball, where over large areas the irregularly degenerating pigment epithelium was covered by young cellular connective-tissue, continuous on the one side with the similar tissue which occupied the ciliary region, and on the other with the circumscribed places in the choroid just mentioned. The choroidal vessels were large, filled with red blood corpuscles, their walls only a little thickened, their adventitia very cellular.

The fibrous body of the crystalline lens which had a nearly normal appearance was separated from the posterior capsule by a finely granular mass, faintly tinged with eosin, which contained here and there Morgagni's spheres. The nuclear zone was atrophic, but the cells of the anterior capsule formed a single layer of very flat cells which extended nearly to the posterior pole as a covering for the posterior capsule.

The retina was totally detached, but, with the exception of its lower portion, it was separated from the choroid by a distance of only two or three millimetres. This space was filled mainly by an amorphous mass of albumin, partly by

young connective tissue lying on the choroid, which was particularly extensive medially and found elsewhere only in the region of the ora serrata. The histological condition of the retina was very variable. Near the papilla it was much folded, as is usual in detachment, so that very intricate pictures were formed on the slides. A layer of nerve fibres was present only in the zone immediately about the papilla. The retinal funnel was filled by a very cellular young connective tissue which merged on all sides with the retina, to a great extent took the place of the absent layer of nerve fibres, and was inseparably connected with the vitreous which was infiltrated with round cells. In this region alone the retinal layers were recognizable as such, though often drawn asunder or pressed together by the folding of the membrane. In this region alone there were present in the layer of nerve fibres as in the papilla numerous dilated blood-vessels with very thick cellular walls, in the adventitial spaces of which, and in the neighboring tissue, round cells were thickly crowded. There were also thrombosed or obliterated vessels with the same condition of their walls.

Closely adjoining there were larger places in which the retina consisted of a laminated tissue occupied by almost colorless, swollen nuclei. In its deeper layers were hyaline stratified masses of coagulated fibrin, in the inner layers of which were numerous dark-colored fragments of nuclei. At these places the necrotic retinal tissue could not be clearly distinguished from the adjoining vitreous. There were both fresh and old hemorrhages, particularly about the well preserved central tissue, and in one place adjoining the neoplastic tissue of the retina and papilla delicate loops of vessels almost destitute of walls penetrated into the necrotic focus.

The important changes in the greater part of the retina were confined to its cerebral layer, were most marked in its lower and lateral portions, and resembled those produced by embolism of the central artery of the retina. The layer of nerve fibres, the layer of ganglion cells, and the internal granular layer were changed into a finely granular laminated tissue containing pale, almost colorless nuclei and intensively stained round cells. The inner nuclear layer was thinned

more than one-half, and apparently was composed wholly of the nuclei of Mueller's radiating fibres; the outer layer was but little diminished and was of nearly normal structure. In the uniformly laminated tissue there were in many places obliterated vessels without nuclei, which could be stained and recognizable wholly by the arrangement of the tissue strata, a condition not met with in embolism, and very few obliterated vessels with thick walls rich in nuclei and enveloped in round cells. In the upper and median portions of the retina the necrosis of the cerebral layer was less marked, but nowhere did the layer of nerve fibres contain nerve fibres, and only scattered pale, large nuclei remained as traces of the large ganglion cells. At such places alone could still be found blood-vessels with mantles of round cells.

In the region of the ora the retina consisted of a vascularized cellular tissue, which merged with the young connective tissue already described as filling the anterior part of the vitreous. The layer of rods and cones had disappeared; the only traces to be found consisted of swollen bulbous or laminated formations on the external limiting membrane.

The papilla could not be clearly distinguished. Into its central portion penetrated the cellular tissue which filled the retinal funnel; its periphery was reduced and formed by a fibrous tissue which contained apparently degenerated nerve fibres with pale, often scarcely stainable tongues of cells, and was infiltrated here and there with round cells. The vessels' walls were thickened and surrounded by thick sheaths of round cells. Beyond the lamina there was an interstitial neuritis; the bundles of nerve fibres at first, especially in the middle, were so worn away that the broad septa, infiltrated with round cells, were brought almost into contact. Laterally and farther back the bundles of nerve fibres were looser and in great part degenerated, but with increasingly numerous well preserved nerve fibres. There was a severe perineuritis.

To briefly recapitulate, there was a very severe plastic iridocyclitis with scleritis which, even without the negative testimony of the bacteriological examination, evidently was not of infectious origin, for in spite of the acute character of

the inflammation the neoplastic tendency was pre-eminent, while all signs of suppuration were completely wanting. In the retina, necrosis was pre-eminent and occurred in two forms, diffuse and circumscribed. The diffuse form was the more extensive, and involved the cerebral layer of the lateral and lower portions of the membrane, where it produced an appearance which resembled that produced by a not too old embolism of the central artery. But in embolism the vessels for the most part persist either partly or wholly obliterated, while in this case the cellular elements of the thrombosed or obliterated vessels could scarcely be stained, so that their sclerotic walls could be distinguished only by their forms from the laminated tissue in which they were embedded. The circumscribed form of necrosis, which exactly resembled coagulation necrosis, was met with only near the papilla, where it involved the entire thickness of the retina, so that, although the tissue was somewhat thickened, the layers could not be recognized. In close proximity to these circumscribed areas the retina was densely infiltrated with round cells and, in the deeper layers, with a network of fibrin and hyaline-like masses. There was proliferation of the retinal tissue, particularly of the inner layers, only on the papilla and in its immediate neighborhood. This form of retinal necrosis seems to me to furnish the key to the explanation of the whole clinical picture.

The affection of the choroid, which was most intense in the lateral portions, was of the same character as that of the ciliary body and iris. It was a non-purulent, chronic, hyperplastic inflammation.

The condition of the vitreous was of importance only so far as the bands attached to or arising from the retina were to be considered symptomatic of a pre-existing retinitis proliferans, because such extensive necrosis is met with in other affections and after infection.

The retinal necrosis may be explained, I think, in two ways: first, as the result of great vascular changes, and, second, as the result of a direct toxic action on the part of the injected hæmolytic serum. The first explanation must be accepted, in part, at least, for the diffuse necrosis of the

cerebral layer, because this cannot otherwise be understood. The injected serum had produced a highly injurious effect on the walls of all the vessels which resulted in an extensive thrombosis of capillaries, arteries, and veins, especially in the peripheral, most poorly nourished, parts of the retina. But the circumscribed necrosis of all the layers cannot thus be explained. The retinal vessels nourish the cerebral layer alone, and therefore occlusion of the central artery produces necrosis confined to that layer. The outer layers of the retina draw their nutriment from the choroid and suffer in their integrity either slightly or not at all in so slight a degree of detachment as was present in this case. We must therefore assume that the necrosis of all the layers of the retina is to be ascribed to an action of the serum injected into the vitreous upon the cellular elements of the retina analogous to that of the hæmolysin upon the red blood corpuscles; in other words, to a toxic collateral action of the serum on the heterogeneous constituent parts of tissue. This action had affected both circumscribed places in the retina throughout its entire thickness, and also the entire layer of nerve fibres which lay nearest to the deposit of serum in the vitreous, so that the retinal vessels lying therein had been very extensively injured, the elements of their walls rendered necrotic, the vessels obliterated. These vascular changes had then, to a certain extent secondarily, caused the diffuse necrosis of the cerebral layer of the retina. Evidence in favor of the latter theory seems to me to be furnished by the fact that the retinal vessels in the periphery were almost everywhere completely necrotic, while in total embolism of the central artery of the retina the vessels' walls proliferate to complete obliteration, but their cellular constituent parts everywhere retain their normal power to be stained.

It is known that the different cytotoxines—that is, the different materials formed in animal organisms by resorption of cells which have the peculiarity of destroying the cells used in the formation of related constituent parts of tissue—have no specific action. Landsteiner informs me that even the imperfect results of certain experiments, such as to re-

establish a nephrotoxic or a hepatotoxic serum, are due to this imperfect specificity. While it may be easy to demonstrate an action in some measure specific when dealing with free cells, it is very difficult to demonstrate a characteristic action on organic cells within the organism, because the action of the serum extends to other kinds of cells as well. Thus there are doubtless in hæmolytic immune serum constituent parts which are toxic for other tissue elements than the red blood corpuscles; therefore the theory is justified that in this case the necrosis of the retina and of extensive parts of the vitreous was due to such a destructive collateral action of the injected serum.

The iridocyclitis, choroiditis, and the proliferating inflammation on and about the papilla may have resulted partly from the irritating qualities of the serum and partly from the extensive tissue necrosis which is of itself provocative of inflammation.

In spite of the bad result in this case, I would not abandon without further investigation Roemer's new therapy for hæmophthalmos, which opens up a hopeful perspective for these otherwise so often incurable cases. It is much to be regretted that as yet no other experiments have been made, or at least reported. Tertsch stated in the *Wiener ophthalmologischen Gesellschaft*, when I reported my experiment, that he had tried a similar injection in one case and that it had not been followed by any change whatever. The non-appearance of any, even the hæmolytic, reaction after the injection, although the hæmolytic power of the serum had been proved in the laboratory, suggests that no serum remained in the globe. Deutschmann used special precautions in his vitreous injections to prevent the escape of the injected fluid during removal of the syringe. Hence Tertsch's experiment seems to me to prove nothing, and mine is the only one from which to judge the therapeutic application of hæmolytic serum. Although this gave an absolutely bad result, I would plead that the procedure be not abandoned, but would beg to submit certain proposals for its prosecution with a view to the avoidance of the injurious effects which accompanied the hæmolysis, the increase of tension,

plastic iridocyclitis, necrosis of the vitreous, and necrosis of the retina.

I would recommend that the serum be used greatly diluted, say one part to ten of physiological salt solution, in order that while the hæmolytic action may be obtained the other cytotoxic components may be rendered ineffective. I would replace by serum only a portion of the fluid drawn from the vitreous in order to avoid the increase of tension. If the desired effect was not obtained at once this procedure, which is certainly harmless, could be repeated as often as desirable with solutions gradually increasing in strength and quantity. If the tension became increased, or if iridocyclitis appeared, I would puncture the anterior chamber or the vitreous in order to accelerate the removal of the injected substance. It is to be hoped that in this way Roemer's ideal may be realized.

CONGENITAL ORBITAL CYST ASSOCIATED WITH MICROPHTHALMUS.[1]

By Dr. RAY CONNOR, Detroit, Mich.

(*With Text-Plates I. and II.*)

CONGENITAL cysts associated with microphthalmus are so rare as to justify the report of a case.

The patient, a baby of ten months, was referred to the clinic of the Children's Free Hospital through the kindness of Dr. Otto Scherer. The child was seen early in August, and advised to enter the Hospital for the removal of the cyst, as it had increased greatly of late. On examination, no malformation other than the eye condition could be found. There was no history of any deformities on either side of the family. The child was a large and healthy breast-fed infant, although the mother said he was smaller than her other children at the same age. The mother has had ten children, six of whom are still alive and well. At the birth of the child, a midwife was in attendance, and no eye could be made out on the left side. The cyst grew slowly at first, and did not come to the level of the orbital rim until the baby was four months old. Its growth became more rapid later. The right eye was apparently normal. The left orbit was filled with a large, fluctuating mass which bulged out between the lids, pressing them both forwards. The palpebral orifice was much distended by the growth, and the lower border of the bony orbit did not extend up as high as on the right side. The lower lid showed a somewhat bluish tint, and the tumor gave no sense of pulsation and could not be reduced by steady pressure. No vestige of an

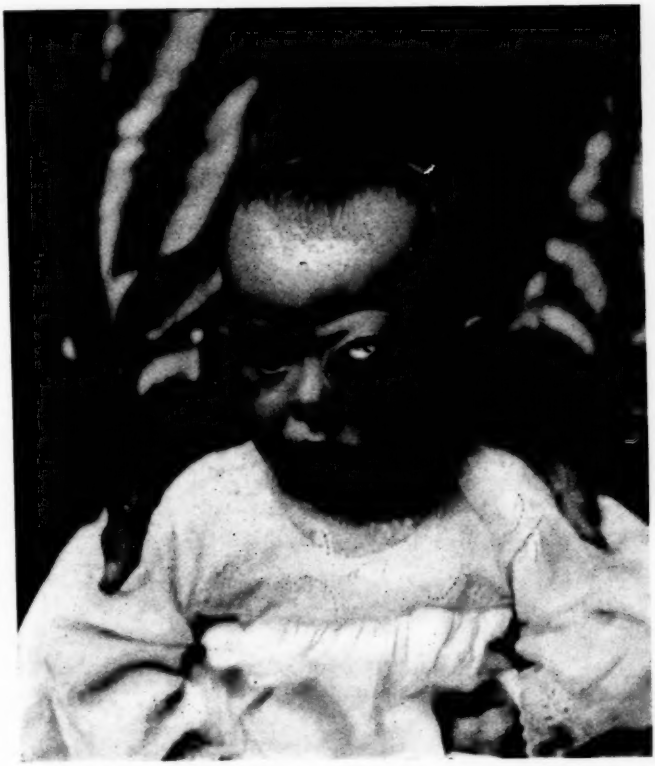
[1] Read before the Detroit Ophthalmological and Otological Club, Nov. 7, 1905.

eye could be made out until the upper lid was strongly retracted, when a rudimentary ball was discovered half hidden by a fold of the conjunctiva. The conjunctiva presenting in the palpebral orifice was roughened and thickened from exposure. An X-ray, taken on the day following admission by Dr. Hickey, showed nothing of diagnostic importance.

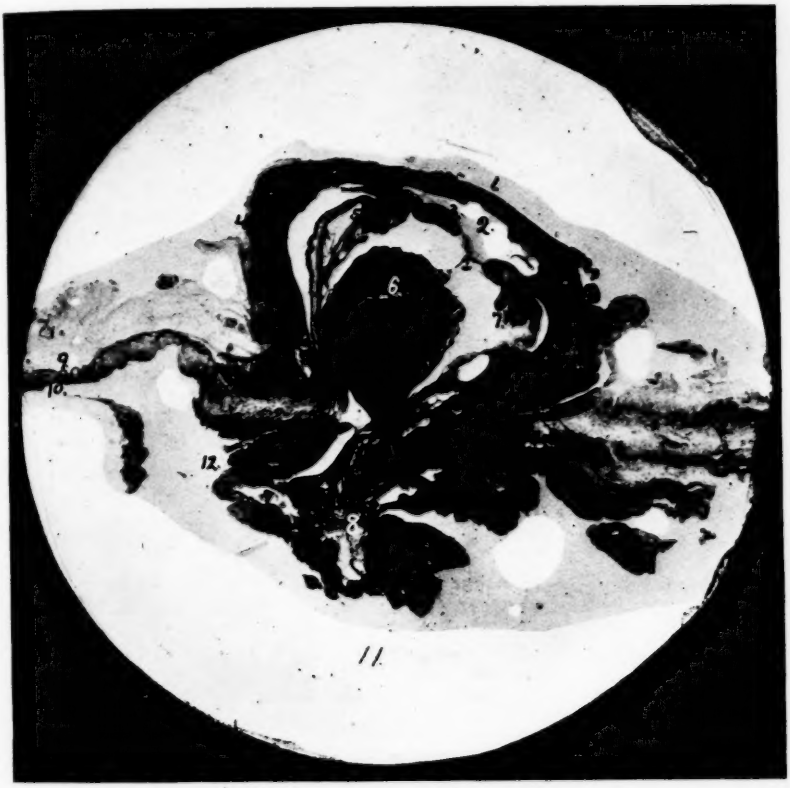
On August 8th, the cyst, together with the rudimentary globe, was excised under chloroform by Dr. Leartus Connor. The outer canthus was cut to give more room for the dissection, but in spite of care the cyst was ruptured in peeling it out and its contents escaped. The fluid it contained appeared to be reddish, but as the rupture was some distance back it may have become stained by the blood of the operation. The cyst extended back to the apex of the orbit, but was not adherent to the surrounding tissues and was completely removed. The extrinsic ocular muscles seemed very much hypertrophied, especially as contrasted with the rudimentary globe. There was little hemorrhage following the operation, and the child made a good recovery, being discharged from the hospital about a week later. The orbit filled in well, and about a month later a small ball of iodoform and paraffin was inserted in the orbit to keep the cavity from filling up. He was later discharged, wearing the ball and with the orbit lined completely with conjunctiva.

Through the kindness of Dr. Leartus Connor, I had the opportunity of studying the specimen. When filled with fluid the tumor measured $4\frac{1}{2}cm$ laterally by $3\frac{1}{2}cm$ vertically and $3\frac{1}{2}cm$ antero-posteriorly. While the cyst had several diverticula, the communication between them was very free, and one puncture emptied the entire cavity. Desiring to find out, if possible, the origin of the cyst and its relation to the rudimentary globe, I dissected out that portion of the cyst wall next the globe and hardened it together with the globe in alcohol and sectioned the specimen in celloidin. The microphthalmic globe was found to be unusually well developed. The cornea presented outward and the nerve inward. The globe measured $7\frac{1}{2}mm$ antero-posteriorly by $10mm$ laterally. The anterior part of the ball was the most nearly like a normal eye. The front of the globe was somewhat flattened, and the anterior chamber was $7mm$ across. The cornea was well developed, although much thinner than the sclera and traversed by blood-vessels in the substantia propria. The sclera was relatively thick, reaching $1\frac{1}{2}mm$ in thickness.

ILLUSTRATING DR. CONNOR'S ARTICLE.



ILLUSTRATING DR. CONNOR'S ARTICLE.



MICROPHTHALMIC EYE SHOWING THE COMMUNICATION BETWEEN THE CAVITIES OF THE GLOBE AND THE CYST.

1. Cornea.
2. Anterior Chamber.
3. Iris.
4. Sclera.
5. Retina.
6. Lens.
7. Ciliary Processes.
8. Folding of Cellular Lining of the Cyst.
9. Outer Fibrous Lining of the Cyst Wall.
10. Inner Cellular Lining of the Cyst Wall.
11. Cavity of the Cyst.
12. Cleft Connecting the Two Cavities.

The anterior chamber was well formed, and no coloboma of the iris was present nor were there any remains of a pupillary membrane. The iris was fairly well developed, and the ciliary processes were relatively hypertrophied as compared with the rest of the globe. The lens was well formed, nearly round, and contained in the cavity of the globe which it about filled. No zonula fibres were to be seen. Inferiorly the sclerotic coat was open and some of its fibres were continued to form the outer wall of the cyst which at some points was quite thin. No bone or cartilage was present in any of the sections studied. The posterior layer of the iris, as well as the ciliary processes, was heavily pigmented, and some of the pigment could be found in the inner wall of the cyst, many of whose cells contain similar pigment granules. The cyst wall was composed of two layers: an outer thin and fibrous, continuous with the scleral wall of the globe; and an inner thicker and much more cellular, continuous with the inner layer of the globe and representing modified retinal tissue. Just where the cyst is in connection with the globe, the inner lining of the cyst is thrown into many folds, giving a papillomatous appearance. A narrow but clear communication can be demonstrated between the cavities of the cyst and globe.

The rarity of these cases is well shown by the fact that only about fifty-seven of them can be found in the literature as far as I have been able to ascertain, and this includes cases associated with anophthalmus as well as microphthalmus, as it is almost impossible to separate these. Several of the cases which were originally thought to be anophthalmic were found to be microphthalmic after the evacuation of the cyst. In an excellent resumé on the subject by Mitvalsky,[1] published in 1890, the notes are given of thirty-eight cases gathered from the literature in addition to two of the author's published for the first time. Since this date I have been able to find seventeen more cases. The first case of the kind on record is one of Arlt's,[2] published in 1858. De Wecker[3] reported a case, and was the first to point out the similarity between the aspirated contents of the cyst and the aqueous humor. Talko[4] studied eight cases, mostly in infants. Manz[5] published two cases, as did Snell,[6] but most of the authors have had but one case to their credit. The

topic has formed the title for three inaugural dissertations, and has given rise to considerable difference of opinion as to etiology.

Since 1890, Gailemaerts [7] has reported a case with a microphthalmic eye and a large orbital lower-lid cyst whose wall consisted of two layers, an outer fibrous and an inner granular, but not clearly defined.

E. Treacher Collins [8] has recorded a case of a small eye associated with two cysts in a man of eighteen years. In a later communication, the same author reported three more cases, the first in a man of twenty-eight years, whose right eye had been small and shrunken since birth and had now become painful. A cyst somewhat larger than the globe and connected with it was filled with altered retinal tissue. The second case was a boy of fourteen weeks, whose left eye was shrunken and had cartilage attached in front above and a cyst below and behind. This cyst was about the size of the globe and consisted of two coats, an outer fibrous, continuous with the sclerotic, and an inner, of ill developed retinal tissue, whose inner surface was directed outward and outer surface inward. The third case was a girl of twelve years, born with a defective right eye. A small eyeball with a cyst attached posteriorly and a little to one side was removed. Behind the lens the interior of the globe was filled with a folded membrane. The cyst had an inner, folded lining membrane, continuous with the folded membrane inside the globe. There was some bone on the inner surface of the choroid near the neck of the cyst.

Snell [9] published three cases in addition to those included in his earlier communication. One was a child of three months with a normal right eye and a cyst in the left lower lid, extending well back into the orbit, but no eye could be found. A second case, in a child of six weeks, had a cyst in the upper lid, and no globe could be demonstrated. In the third case, a child of ten months, the cyst was in the lower lid and associated with microphthalmus. It however swelled up on crying and seemed to pulsate synchronously with the frontal fontanelle.

Thalberg's [10] case was a child of two years, with a microph-

thalmus where the globe was pushed upward and somewhat inward by a partly solid and partly cyst-like tumor, which originated in the sclera and extended to the inner-lower angle of the orbit. The left eye, as in so many of these cases, showed a coloboma of iris and choroid.

Fromaget [11] described an orbital cyst causing protrusion of the lower lid and associated with microphthalmus. It had three divisions, a stalk extending toward the optic foramen, a smaller anterior cyst, whose outer wall resembled the cornea, lined with a pigmented membrane and containing an opaque lens, and a middle large cyst united with the stalk by a narrow opening and lined with mucous membrane.

Bernheimer [12] reported a six-weeks baby with hydrocephalus and microphthalmus, with small cyst below and behind the globes.

Becker's [13] case was a boy, aged six months, with a tumor lying beneath the conjunctiva of the lower lid, filling the entire palpebral fissure and pressing the lower lid forward. The tumor was translucent, fluctuating, and as large as a pigeon's egg. The eyeball was small and cornea opaque. The child was otherwise healthy. In this case there was a communication between the eyeball and cyst through a cleft in the former, and through this a fibrous tissue rich in cells passed from the interior of the ball into the interior of the cyst.

In this country, Harlan [14] has reported two cases. In one, the left eye was normal, and the tumor was about the size of a small hen's egg and completely filled the orbit. No evidence of an eye was found when the tumor was enucleated. The patient died presumably from shock. A peculiar tissue was found in the tumor, which resembled atypical cerebral tissue, and which contained the typical perivascular spores about the blood-vessels and nerve nuclei corresponding to those of the neuroglia. The other case is more typical. The patient was a girl of seven, without other history than that the tumor was supposed to be congenital and thought to be increasing in size. The left lower lid was pressed forward by a large incompressible but tensely fluctuating cyst,

the bluish color of which was evident through the thin skin. The tumor was 40*mm* by 25*mm*, and the lower margin of the orbit was 5*mm* below the level of that of the other eye. At the bottom of a deep conjunctival sac above the cyst, a rudimentary eyeball, apparently scarcely larger than a pea, which moved freely in unison with the other eye. The right eye was perfect and no other abnormality could be found elsewhere. The cyst was removed without difficulty although it reached the bottom of the orbit. It was filled with a clear yellowish fluid, but no connection with the rudimentary globe could be demonstrated.

Hoppe [15] has recently described two cases, one an infant six days old, whose right lower lid was distended with a cyst, and at the bottom of the right orbit a rudimentary eye the size of a cherry was present. In the other case, a child of two years, the right eye was absent and could not be found even after puncturing the cyst.

Cruise [16] has had a case in a woman twenty-four years old, who had had from birth a swelling in the left orbit associated with a microphthalmic eye pushed into the upper and outer quadrant. The orbital contents were eviscerated and during the operation some clear fluid escaped. The pathological interest centred in the very free communication that existed between the interior and exterior of the globe by a wide coloboma at the posterior pole, a condition which permitted the free passage of the fluid secreted by the well developed ciliary processes into the cyst, producing the increase in size which necessitated operation.

Various theories have been advanced in order to explain the origin of these congenital cysts. Arlt,[3] from a study of his first case, thought that it was due to a coloboma of the iris and choroid, with the secondary formation of a large diverticulum by the bulging of the ocular coats inferiorly. This is practically the **encysted coloboma** of later writers.

Wicherkiewicz [17] held that as a consequence of the void occasioned in the preformed orbits by the total absence, little development, or intrauterine resorption of the globe, the eyelids yield to the external pressure and turn themselves into the empty cavities. As they do not fill the void, there

is formed in the cellular tissue of the lower lids a serous transudation, to fill the void in question. The liquid encysts itself in a membrane from the connective tissue in its own immediate neighborhood. Subsequently the cysts, partly from their own weight and partly by the dragging of the orbicular muscle, detach themselves from the internal wall of the orbit.

Chlapowski's [18] case was considered as an atheromatous cyst.

Talko [4] thought these have nothing in common with the ocular globe, and place an obstacle to a complete development of the eye or hinder its evolution completely. He seems to admit that these cysts arise in the fœtus by the entanglement of the upper part of the lachrymal sac (Hoyer's hypothesis) during the process of welding the lachrimal fork, and are cysts of retention.

Berlin [19] believed that it was more than a coincidence that these cysts were associated with anophthalmus or microphthalmus, and that they arose from the same embryonic tissue which normally goes to form the eyeball.

Manz [5] thought that a scleral cyst may become greatly enlarged and cut off from the ball, so that the former communication may be represented by a fibrous cord. Since the inner scleral layers which rest on the choroid may probably be separated from the outer scleral layers by the increase in cystic fluid, this dehiscence of the scleral layers may increase in every direction, and include the greater portion of the ball. The cornea and optic nerve form the limits of such an extension.

Van Duyse [20] considered these cysts to have three modes of origin: First, cysts corresponding to hydrophthalmus, due to a high degree of fœtal cystic degeneration of the ball, and very probably due to an intra-uterine chronic inflammatory process of the uveal tract. Second, dermoid cysts, arising from invagination of the external germinal vesicle in connection with the eye. Third, subpalpebral serous cysts, with microphthalmus or anophthalmus, which appear to be derived from an encysted coloboma. The frequent, almost constant association of these cysts with a

rudimentary or ill-formed eyeball of itself suggests some causal relationship between that condition of globe and the cyst pressing forward the eyelid. Another point is the presence of these cysts in the inferior part of the orbit and the ordinary position for colobomata of the eyeball at the lower side. He gives a table to aid in the diagnosis from meningocele.

It was Deutschmann [91] who advanced the theory that so-called arrests of development were only changed developments of the eye, the result of intra-uterine inflammation.

Dor [28] believed that in fœtal life a portion of the embryonic vitreous, having been cut off outside the ball by a premature closure of the fœtal cleft, had developed into a cyst.

Kundrat [29] thought that in the genesis of these cysts the retinal tissue, *i. e.*, the tissue of the primary optic vesicle, pushing through the open fœtal cleft into the embryonic tissue outside, is enclosed and cut off by the latter, thus forming a cyst. He believed the basis of this embryonic tissue to be the mesodermic tissue which should have formed the poorly developed vitreous, and the check in the development of the vitreous and in the closure of the fœtal cleft was primary, and the proliferation of the retinal tissue—not simply its bulging out—was secondary.

Collins [8] says: "In all the specimens which I have examined, the changes are best explained by considering the inner layer of the secondary optic vesicle to have become unusually rucked and folded, due to some imperfect development of the vitreous humor or delayed closure of the cleft; that, as a result of this rucking and folding, a portion of the inner layer of the secondary optic vesicle has become extruded through the fœtal ocular cleft into the subadjacent mesoblast, where in some cases it has subsequently become expanded into one or more fluid-containing cysts."

Fromaget [11] advocates the theory that, at the time of the junction of the nasal and superior maxillary process, a bulging of the nasal mucous membrane had taken place, forming a cyst which altered the optic nerve and eyeball and produced an apparent anophthalmus.

Mitvalsky[1] concluded, from the relationships found, that the distal layer of the primary optic vesicle must have retained its original position. That no invagination occurred to form the secondary optic vesicle is shown by the absence of the lens from the interior of the ball. The scarcely recognizable rudiment of the lens has merely broken through the distal wall of the vesicle without invaginating it. Whether this has played any rôle in arresting the development of the eye is not clear. With the development of the coats of the eye went hand in hand the secretion of the ocular fluid by the well-developed retinal epithelium, and the current took the direction of the least resistance and passed into the folded products of the distal layer, developing in the neighboring mesoblast and distending it. And when a fibrous sheath had formed about these products, preventing their uniform distension, the weaker portions of the sheath yielded and a large reservoir was formed, preventing the proper development of the inferior orbital wall, and eventually pushing out into the lower lid. To support this theory, it is necessary to show that there has been no involution of the primary optic vesicle, and that it has retained its original relation to the surrounding mesoblast. The simplest proof of this is in the inverted position of the retina, which has been found in every case examined. The lens or its rudiment cannot be within the ball, but must be in the connective-tissue coat, if there has been no involution of the vesicle. Nor can such a ball contain the retina in its normal relation to the pigment epithelium. There are, however, cases of this malformation where the lens lies in the interior of the eye, and where there may perhaps be a retina of normal structure and position, the partially developed ball being in connection with cysts. In these cases, the distal wall of the primary vesicle must have become involuted in its anterior portion, forming a normal retina, while near the optic nerve it has not become involuted, and this portion must have become distended, forming a cyst. In this manner, we may explain the cases in which there is a cyst near the optic nerve of a ball that is fairly well developed.

Hess[24] thinks that the invagination and closure of the

secondary optic vesicle took place in a fairly normal manner. In the region of the closure, a portion of the bulbar wall had so little resistance that after the closure it yielded to the intraocular tension and became greatly distended. The outer wall of the secondary vesicle followed this distension and lined the inner surface of the cyst wall, exhibiting various changes. In regard to the old theory that a fœtal sclero-chorio-retinitis is the cause of these malformations, the examination of a number of microphthalmic eyes with colobomata has shown that in many there are no indications of a recent or an old inflammation; that the supposition of slight individual differences in the development of mesodermic tissues entering the vitreous chamber through the fœtal cleft is supported by many facts and many analogies in general histology, and permits the explanation of these malformations in a relatively simple way.

The case here reported seems unusually typical of this class of malformations. The microphthalmic eye is unusually well developed and the communication between the cavities of the globe and the cyst well shown. The question whether the cause of such malformations is inflammatory or not seems far from settled. We can only say not proven. That this cyst had its origin from embryonic tissue which should normally have gone to form the eye seems clear, but whether the mesoblastic origin of the vitreous is at fault or the tissues around the fœtal cleft of the secondary optic vesicle, is hard to say. Hess's view would certainly seem to explain the specimen better than that of Kundrat and Mitvalsky.

The only practical consideration lies in the diagnosis from meningocele which is sometimes difficult. In this connection aspiration of the cyst and a chemical and microscopical examination of the aspirated fluid should be performed before a more radical step is undertaken, as an attempt to enucleate a meningocele might easily lead to meningitis and death. My thanks are due to Dr. Leartus Connor for his kindness in allowing me to report the case.

VAN DUYSE'S TABLE

Fluid of Cyst (Encysted Coloboma).	Aqueous Humor.	Cerebro-spinal Fluid.	Hydatid Cyst.	Dermoid Cyst.
No formed elements. Color lemon-yellow. Very slightly oily.			Little crowns of hooklets; little sacs.	Fatty crystals, notably plates of cholesterine; fatty globules; epidermic elements; soft hair.
Feebly alkaline.	Alkaline.	Alkaline.		
By heat the fluid thickens, becomes gelatinous and milky, and the condition does not disappear with nitric acid.				
White precipitate, very abundant with nitric acid, increased by boiling (albumin).	Albuminoid matters (fibrin, etc.) very feebly precipitated by acids.	Not coagulable (according to G. Gautier).	Absence of albumin.	
White precipitate, very abundant with chlorhydric acid; application of heat causes then the coagulation of all the liquid.				
No effervescence with acids.	No effervescence with acids.	Slight effervescence with acids (carbonates).		
The addition of a solution of AgNO. 1 %, produces a white precipitate soluble in ammonia, insoluble in nitric acid.	Contains 7 % of chlorides.	Chlorides absent.	Contains chiefly chloride of sodium.	
No deposit with Fehling's solution.	No effect on cupropotassic reagent.	The alcapton (Bodiker) or glucose (Cl. Bernard) contained in this fluid throws down Fehling's solution.	Often grape sugar; sometimes succinic acid (Heintz, Honij, etc.), inosite (Wright).	

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A PLASTER OPERATION ON THE EYELIDS BY MEANS OF SKIN FLAPS TAKEN FROM THE NECK.

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OCULIST, MICHAEL REESE HOSPITAL, ST. MARY OF NAZARETH.

(*With one figure in the text.*)

Yetta D., is a young woman, aged twenty-two, afflicted with epilepsy; several years ago, during a fit, she fell onto a hot stove and the right side of her face was frightfully burned. She was taken to the County Hospital where she remained several months.

At the time the patient presented herself, the entire right side of the face from forehead to below the angle of the jaw was scarred and disfigured; there was complete ectropium of both the upper and lower lids; the mucous membrane of the lids was thickened and swollen, the bulbar conjunctiva was red, and the cornea slightly hazy. The pupil reacted freely, and the vision was not quite $\frac{20}{30}$.

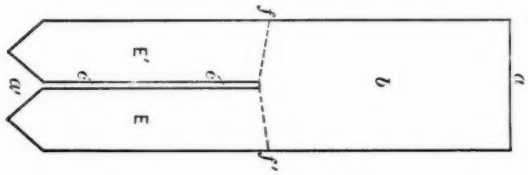
Evidently at the County Hospital the defects left by the burns had been covered with Thiersch grafts taken from the right arm, for the slightly raised skin areas, where the grafts had taken, could easily be distinguished, throughout the burned area, surrounded by scar tissue. Such grafts had been placed on both upper and lower lids, and in spite of the fact that the grafts seemed to have taken well, contraction occurred just as if no grafts were present; moreover, the grafts on the lids were not spread out evenly but were wrinkled up into a small compass so that it could easily be seen how much the grafts themselves had shrunk.

The right arm from elbow to shoulder was covered with scars where the Thiersch grafts had been cut.

The patient was very anxious to have the ectropium remedied, so an operation was decided upon, and she was sent into the Michael Reese Hospital where, with the help of Dr. Gaus, the following operative procedure was carried out:

Incisions were made parallel to the borders of both upper and lower lids, about one-half centimetre from the edge of the lid; all adhesions were then dissected out freely, and the lids put upon the stretch by suturing the upper and lower lids together.

A skin flap was then cut, reaching from just below the angle of



the jaw almost to the clavicle, the pedicle at the angle of the jaw being almost two centimetres in width.

The free or lower end of the flap was then split upwards for a distance of about four centimetres, thus making at the lower portion of the flap two distinct flaps, each united, of course, to the common pedicle (see sketch); one of these secondary flaps being intended to fill in the defect of the upper lid, the other for the lower, both getting their nutrition from the pedicle of the main flap.

The whole flap was now turned upward, and the two dependent flaps on the end were sutured into their respective places with fine silk sutures, the higher one on the upper lid, the lower one on the lower lid, great care having been taken to supply a surplus of skin for the defects to account for future contraction; this was a simple matter, for an ample supply had been easily obtained from the neck. When the flaps had been sutured into place there was a bridge of skin extending from the bases of the secondary flaps to the pedicle of the main flap at the angle of the jaw, about nine centimetres in length; this bridge was carefully protected from contact with the skin of the cheek by numerous guttapercha strips passing under it; guttapercha strips were also placed over it, as well as over the new skin of the eyelids; over this was placed plain dry gauze and a bandage applied.

By undermining the edges of the wound in the neck, I found no difficulty whatever in coapting them.

The bridge of skin passing over the cheek was allowed to remain *in situ* six days, and was then cut off; where its connection with the lid flaps was severed at the outer portion of each defect in the eyelid, after freshening the edges of the defect, the cut portions were sutured into their proper places; blood oozed nicely from the cut surfaces, and although a few of the sutures holding the flaps in place sloughed out, of the flaps themselves there was no slough whatever.

It is now eight months since the operation was performed and the result of the operation is a perfectly satisfactory one, with perhaps this exception—*i. e.*, the skin of the upper lid seems a trifle too heavy, giving the lid a slight droop; as, however, contraction at the end of eight months might still be expected I should call this an advantage rather than a defect.

As Czermak aptly says: "Every plastic operation for cicatricial ectropium of the eyelids is in a category of its own; there are no cut and dried rules which will apply to all cases or classes of cases."

In the above described case, several other procedures might have been employed. The defects of the lids might have been covered by means of Thiersch or Wolfe grafts, but where large defects of the lids are to be repaired I am thoroughly skeptic as to the advisability of employing grafts; I agree with Valude when he says it is not "Méthode de choix," but "Méthode de nécessité." I have found that not only does contraction of the deeper tissues go on just the same, but the graft itself shrinks and contracts to such an extent that I believe in many cases it actually adds to the deformity; how these cases look in two or three months is no criterion as to the ultimate outcome.

I believe most of us have observed cases where, although the graft seemed to have taken perfectly, it afterwards seemed to undergo a peculiar crusty desquamation; it then would shrivel and shrink so that anybody watching the case would be bound to conclude that the new skin had undergone actual degenerative changes.

Another method which might have been employed was the

so-called Italian method (Branca, Tagliacozza, von Graefe); immobilizing the arm to the side of the head, suturing a flap from the arm to the eyelids, leaving the pedicle attached to the arm till nutrition was established, and then severing the connection; this procedure, however, is far more difficult of execution, causes severe discomfort and suffering to the patient, and, on account of difficulty of perfect immobilization and sterilization, far more dubious as to the outcome than the method employed. It is true the Italian method causes less disfigurement, but this hardly enters into the question as the long scar on the neck is almost entirely concealed by the collar.

In some cases the neighboring scar-tissue forms useful material for flaps; here, however, on account of the extent and severity of the injury it was hardly to be considered. An objection which might be made against using skin flaps from the neck is on the score of its wastefulness, the entire bridge from the angle of the jaw to the defect in the eyelid being cut off when nutrition is established; this is, however, hardly a valid objection as the loose skin of the neck affords more than an ample supply, it being, moreover, an easy matter to close the defect in the neck without putting the least tension on the skin.

In the case described, I found this method so easy to employ, so satisfactory, and, moreover, so little productive of deformity, that although I employed it here almost through necessity, in the future where large defects of the lids are to be remedied I should employ it as the operation of election, even though the skin of the face were well adapted for plastic purposes, because it is just as easy of execution as if the skin were taken from the face, it produces far less deformity, and if the flaps should slough far less damage has been done than if we should lose flaps taken from the face. Moreover the loose skin of the neck is far better adapted for plastic purposes on the eyelids than the thicker skin of the face and forehead.

MEETING OF THE OPHTHALMOLOGICAL SECTION OF THE BRITISH MEDICAL ASSOCIATION, AT LEICESTER, WEDNESDAY AND THURSDAY, JULY 26 AND 27, 1905.

WEDNESDAY, JULY 26TH. DR. G. A. BERRY, PRESIDENT, IN THE CHAIR.

The President in opening the work of the Section reviewed in brief the recent progress of ophthalmology, after which the following papers were read.

Dr. A. BRONNER (Bradford) read notes on a case of **emmetropia** in which distressing local and general symptoms had been relieved by the use of — 1 D spherical with — 1 D cylindrical glass.

He referred to the many cases that every one is familiar with, in which the correction of small errors of refraction had relieved local and general symptoms, and to the still more marvellous cases that were frequently seen reported in the lay press. In America, heterophoria is the cause of many of these wonderful symptoms, and in England slight errors of refraction are said to produce them. The case here recorded is one which shows how careful we should be in believing the statements of patients and how the use of glasses which are absolutely wrong can produce the same results. The patient was a man aged twenty-four, who came to Dr. Bronner, stating that the glasses he was wearing were simply wonderful and he required no alteration in them, but he wished to know whether, if he left them off, it would cause injury to his health, as they interfered with his promotion in business. Before he wore glasses, six years ago, he had been in indifferent health and was unfit for work. He also suffered much from headaches. He had always seen fairly well at a distance, but had to bend his head much in reading. As soon as he began to wear glasses, all his distressing symptoms disappeared and he gained several stones in weight. On examination he read $\frac{6}{18}$ and J i with difficulty with his glasses, $\frac{6}{12}$ and J i easily without them, and with — 0.5 $\frac{6}{6}$. The disks were congested and both eyes practically emmetropic. He was wearing spherical 1 D and cylindrical — 1 D. In this case the cure was obviously due to suggestion

only, and possibly was assisted by the fact that with the glasses he was obliged to hold his head up when reading.

This case shows how careful we should be to examine all eyes thoroughly, for it is certain that such a case as this one could quite well have been cured by atropine and by holding up the head when reading.

Mr. E. E. HENDERSON read a paper on the effect of **atropine and eserine on the filtration of fluid through the eye.** The apparatus employed was slightly modified from that previously used, a description of which was published in the *Journal of Physiology* in a paper by him and Professor Starling. The fluid used was normal salt or Ringer's solution which had previously been filtered through a Berkfeld candle. On raising the pressure in the living eye, a certain rate of filtration was observed and recorded by the scale attached to the tube. This rate increased with the pressure and was due partly to increased filtration and partly to diminished production of the normal intraocular fluid. This rate depended on numerous factors, some of which had been noticed by other observers. There was one factor of which they had previously met with no account, and that was the rate of filtration of fluid when the eye was under the influence of atropine or eserine. The rate of filtration at artificially raised pressures was found to be considerably larger in the eye under eserine than when under atropine. That this effect was not purely mechanical was proved by the free filtration that was observed after death. Possibly at these high pressures other channels were opened in the eye when the pupil had been fully contracted with eserine, as, for instance, the surface of the iris.

The following are figures taken from a typical experiment.

Cat anæsthetized with ether.

Blood pressure—average 138*mm* and varied very slightly throughout the experiment.

Intraocular Pressure.	Rate of filtration in eserine eye in cubic *mm* per minute.	Rate of filtration in atropine eye.	Rate of filtration in atropine eye immediately after death.
26.	0.	0.	15.
46.	11.	8.	20.
66.	16.	11.	25.
86.	23.	14.	31.

It will be noticed that the intraocular pressure is the same in both eyes, namely, no filtration took place in either eye at 26*cc* pressure.

Mr. Bishop Harman read notes on the **result of electric treatment of trachoma as practised at the Middlesex Hospital.** Some cases had been treated with X-rays, others with high frequency currents, and others with radium. The results in all were most unsatisfactory, and none of them did anything like so well as when treated with the more usual applications such as copper or silver.

Mr. Devereux Marshall agreed with what Mr. Harman had said, and he stated that his own experience of X-rays and radium had not been by any means encouraging, and he much preferred applications of copper or silver.

Colonel Drake-Brockman said that he was pleased to hear the views expressed by the reader of the paper and Mr. Devereux Marshall. He had watched with interest all that had been published on the subject, and was not satisfied with the results that had been given. He had himself always relied on therapeutic application for the relief of trachoma. He had more recently used argyrol and cuprol with massage, a plan of treatment which was painless and excited no terror in the minds of patients. He had now abandoned the more powerful and caustic remedies which were formerly so much used. The President and Dr. Bronner also took part in the discussion.

Mr. Bishop Harman described a case of **false hay-fever.** It occurred in a lady who never had a sign of hay-fever until she went to reside in a district surrounded with pine trees. She then suffered severely. The usual remedies did little or no good. Mr. Harman then examined her eyes and found some astigmatism which he corrected. Since that time the symptoms completely disappeared. He ascribed this to the fact of unequal refraction setting up an irritation on the retina, which by a reflex action stimulated the fifth nerve.

Mr. Devereux Marshall asked how, if Mr. Harman's theory was correct, he could account for the fact that such patients suffered only in the spring, when the light was as strong or stronger later on in the summer, and nearly always was so at sea, when such patients never suffered in this way.

Mr. Harman, in reply, said that the retina got more accus-

tomed to the light than it was when the eyes had been used to the dull light of winter.

Dr. KARL GROSSMAN (Liverpool) gave a lantern demonstration of **lepra ophthalmica.** He showed a large number of colored photographs, which he had taken in Iceland, of patients suffering from leprosy, which showed in a remarkable manner the lesions caused by the disease.

Dr. KARL GROSSMAN recorded a case of **congenital absence of the dilator of the pupil.** The patient was a little girl, aged five and a half years, quite healthy in every respect, and well developed mentally and physically. The right pupil was eccentric and almost slit-like, its position being upward and inward. The iris was tremulous, and careful examination showed that the lens was absent. After atropine the pupil became a mere shade wider than before, and a small moving mass was visible behind the lower margin of the pupil. This was evidently a rudimentary lens; there was no trace of capsule seen in the pupil. The fundus appeared to be normal, and after eserine the pupil contracted to a narrow slit. The left eye showed the same condition, with the exception that the lens was not visible at all. The effect of eserine showed that the sphincter was present, but the very slight effect of atropine was due to the paralyzing effect upon the sphincter. There were no posterior synechiæ present. Dr. Grossmann knew of no similar case on record.

Dr. GROSSMAN also read a paper on the **treatment of conical cornea by the hot-air cautery.** He pointed out that any form of red-hot substance had the disadvantage of causing necrosis of any tissue it touched, and in addition it was difficult to accurately regulate the temperature. This could be more satisfactorily obtained by superheated air, as employed in an instrument devised by Dr. Hollander, of Berlin. It consisted of a Paquelin cautery, in which was a platinum coil, the air in the coil was heated by the Paquelin, and the rubber tubing was so arranged that the same set of bellows which supplied the cautery sent an ordinary fresh in-current through the heated metal coil. He had used this cautery for various eye and lid diseases, and particularly for conical cornea. In operating for this, the stream of hot air was allowed to fall upon the apex of the cone. In order to keep the instrument absolutely steady, a transparent shield of mica was used, through which the point of the cautery could

project. Care should be taken not to do too much, for the hot air dries up the epithelium all round, but this rapidly regains its normal transparency. He had used it on five cases with satisfactory results.

A demonstration of the instrument followed.

Dr. CECIL SHAW (Belfast) read notes on a case of **toxic amblyopia.** The patient, a man aged twenty, was first seen by him on February 10, 1905, on account of sudden failure of vision. He was a carpenter, and a fine, healthy-looking man, with nothing of note in his family or personal history. Five days before, he had an attack of influenza; on the seventh he rode out on a bicycle, but was sent home, as he did not look well. His sight was becoming dim, and when first seen on the 10th he could only count fingers with the right eye and could see nothing with the left. The pupils were widely dilated and the fundus appeared normal in both. He stated that for a day or two he had lost all sense of taste, but that had returned. On February 17th, he could not even count fingers; there was numbness of the right leg, arm, and side. Paresis of the left internal rectus then appeared and a divergent squint developed; the lids remained half closed. On February 21st his gait was staggering. For some weeks his vision remained the same, but his general symptoms became more marked, and he was sick every time he tried to rise.

On March 22d, his vision had decidedly improved, and he could count fingers with both eyes; the sickness had disappeared and his strength was returning. His memory was very defective, and he could remember nothing of the first few weeks of his illness.

On May 5th he could walk fairly well and the vision was steadily improving. On June 8th he saw Dr. Shaw again; he was quite well and strong, except for his sight, which had, however, improved to R V $\frac{1}{24}$ and L V $\frac{1}{5}$. The fundus remained quite normal.

THURSDAY, JULY 27, 1905. DR. G. A. BERRY, PRESIDENT, IN THE CHAIR.

The discussion on **intraocular tuberculosis** was opened by Mr. W. H. H. JESSOP, who limited himself to dealing with the disease as it affected the choroid, iris, ciliary body, and retina, and as the chief seat of lesion was the choroid, he dealt at length

with the two principal forms in which it was met—viz., miliary tubercle and solitary choroidal tubercle; of the latter an analytical table of twenty cases, collected from various authors, was given.

Solitary tubercle was, he said, generally found as a rounded spherical body of a gray, white, or yellow color, starting beneath the retina from near the optic disk, but it seldom tended to infiltrate the retina. The surface was nodular, and the whole mass sometimes flecked round with spots like diabetic retinitis, but not pigmented. Yellowish, caseating spots were sometimes seen on the surface. Hemorrhages might occur, but they were not often recorded.

In miliary tubercle of the choroid, tuberculous meningitis was nearly always present; out of fifteen cases at St. Bartholomew's Hospital, fourteen had it, while the other had general tuberculosis.

Tubercle of the iris and ciliary body were next treated, and also that rare condition, tubercle of the retina.

As to diagnosis, the best test was inoculation experiments. In many cases, especially if caseation had taken place, the bacilli were not to be found; the other signs, such as giant cells, etc., were of very minor importance.

He had never seen a case of primary intraocular tuberculosis, and he doubted much if such ever occurred. In acute miliary tuberculosis, choroiditis was found to be present in about 50 % of the post-mortem cases and about 30 to 35 % ophthalmoscopically during life. He had not had much experience with tuberculin, but he felt sure that the old tuberculin was not trustworthy and it often did much harm. The excellent results of von Hippel when using tuberculin T R led him to think it should be tried in every doubtful case for diagnostic purposes, and on all the cases as a means of treatment. The largest dose to begin with should not exceed $\frac{1}{100}$ *mg*, which could be increased gradually to 1 *mg*.

He much deprecated excision of tuberculous eyes unless there was great pain and the general health was much affected thereby. As the condition was not primary, the disease could not by this means be removed, and there was real danger of setting up meningitis, as shown by the fact that out of eleven cases that were excised eight died within two months from this disease, which was a great contrast to Schieck's thirteen cases treated with tuberculin all of which recovered and not a single eye was lost.

In miliary tubercle of the choroid he had never seen vitreous opacities, neither were they present in his two cases of chronic choroidal tubercle which were cured after the latter condition was cured. The most remarkable thing was the small apparent change in the part of the fundus where the tubercle existed, and also the absence of pathological pigmentation even in the neighborhood of the greatest lesion.

In the cases of pulmonary phthisis at St. Bartholomew's Hospital he found no note of choroidal changes, but Carpenter and Stephenson found 11 cases out of 119 in children, or 9.24 %.

In his two cases in which tubercle was demonstrated, or inoculation experiments succeeded, and thus made the diagnosis sure, he found after the lapse of four and five years that the changes were not visible in the macular region but started near the disk, as did also most of the twenty cases detailed. The absence of much scarring, and the total absence of pigmentation seemed to distinguish the cases from those of syphilitic type.

Professor HESS said he had made tuberculin injections in 26 cases, in 18 he used the old tuberculin, and in 8 the tuberculin T R. In 50 % of the cases (9 of the old and 4 of the T R), general reaction followed; in 2 only, where there was iritis, local reaction was noted, and in these cases of iritis general reaction followed in even more than 50 % of the cases. Besides these, general reaction was found once in a case of recent choroiditis and once in a case of interstitial keratitis. He thought that local reaction only should be considered as proof positive of the tuberculous nature of the iritis or keratitis, but as we so often found general reaction in cases of iritis which clinically show the same signs as those which give rise to local reaction, it seemed to him probable that a great many cases of iritis were caused by tubercle. As to the therapeutic effect, he had not sufficient experience to say much except that he had never observed any ill effects from the injection, and in one case of iritis with strong local reaction a very evident improvement in the condition was observed.

Dr. JOHN HERN (Darlington) said he had had many cases treated with the new tuberculin used according to Koch's directions. In at least 85 % there was general reaction, and in about 50 % there was some local reaction. As a means of diagnosis it was very useful, but he considered it quite useless for treatment, or even harmful, for some cases appeared to get worse as the result of the increased inflammatory changes set up in the eye.

Dr. Cecil Shaw (Belfast) had seen a case of apparently primary tubercle in a boy aged nine. A small tumor appeared on the inner side of the left eye, and as it increased rapidly the eye was enucleated. Previous to this some retinitis was seen in the right eye, and a few weeks later signs of meningitis appeared, but these passed off. During the next two years the patient suffered from tuberculous abscesses and bone disease on the left arm, leg, and side. Under general treatment the health was slowly restored, and except for lameness the patient recovered. The enucleated eye showed a typical tuberculous growth.

Mr. W. M. Beaumont (Bath) related the following case. A girl, aged ten, was seen by him at the Bath Eye Infirmary in September, 1900, with a phlyctenule at the outer margin of the left cornea which had been seen for fourteen days. In spite of treatment it remained in a chronic condition until the following February, when it healed. In July it broke down, but in three months it healed. For more than two years it gave no trouble, but in February, 1904, she returned in a similar condition. This time it healed quickly. In July, 1904, she was admitted with episcleritis of the same eye; this spread, but by September it had got well. In October she developed iritis in the same eye, and this was cured in a month, and the vision which was $\frac{6}{6}$ became reduced to $\frac{6}{12}$. A week after her discharge she returned with optic neuritis in the same eye, and this remained until January, 1905, when white spots showed themselves in the macular region. The urine was healthy, the sight remained at $\frac{6}{12}$, and the field was full. On February 16th the spots were more numerous, a month later the vision had improved to $\frac{6}{9}$, but two weeks afterwards the glands of left side of the neck became enlarged; they increased in size and number during the following four weeks. The child was ailing and low-spirited, with temperature 99.4°. On April 20th the retinal spots had disappeared, but one of the supraclavicular glands became enlarged and a week later it was increased and thick pus was evacuated containing numerous tubercle bacilli. During May a retinal hemorrhage occurred near the disk, and shortly afterwards she was seen by Dr. Freeland Fergus, who found chronic optic neuritis, but the hemorrhage had disappeared. Her general health began to improve and she became bright and lively, and now, two months later, she is in excellent health, the glands have subsided, she has no cough, and there are

no signs of tubercle. The right eye had been healthy throughout, with vision of $\frac{6}{6}$.

The point he raised was whether the tubercle bacilli obtained entrance through the phlyctenular ulcer, and if they did not what was the cause of the cycle of events; the iritis was not nodular and there was no tuberculous choroiditis. He himself believed with Eyre that a broken-down and ulcerated phlyctenule "makes an excellent nidus for the tubercle bacillus" and that this is the explanation of the case. The white spots in the retina have been noted by Story and O'Sullivan in a case of undoubted tuberculosis of the retina.

Mr. TATHAM THOMPSON (Cardiff) mentioned a case he had seen eight or nine years ago, in which he had excised an eye for the relief of severe pain, in which tuberculous choroiditis and iritis were diagnosed. Death from tuberculous meningitis occurred within three or four weeks.

Sir VICTOR HORSLEY rose to obtain the view of the Section on the practical point raised by Mr. Jessop, that in chronic tuberculosis choroidal changes did not occur which could be regarded as specifically characteristic. He further wished to learn in reference to the case quoted by Mr. Beaumont, whether the view which he understood had been advanced some years ago, that in acute cases of central tuberculous infection the changes in the fundus were specifically distinguishable from those set up by or accompanying other forms of intracranial disease, had been confirmed.

Remarks were made by Mr. LAWFORD and Mr. BISHOP HARMAN, after which Mr. JESSOP replied.

Dr. J. HERN (Darlington) made some observations on the effect of the presence of adenoids and other abnormalities in the naso-pharnyx on some affections of the eye. Soon after Meyer of Copenhagen had drawn attention to the facial and other indications of adenoids, Dr. Hern noticed that they were especially present in cases of phlyctenular, eczematous, or scrofulous conjunctivitis, and, unless the naso-pharyngeal condition was treated, the eye symptoms frequently recurred, whereas if the adenoids were removed recurrence did not take place and the child lost all the facial peculiarities that had been so obvious. In all such cases, a careful examination should be made by a rhinologist, no matter whether the patient be a child or an adult, as both conditions are manifestations of the so-called strumous diathesis.

In his opinion, the eye condition was secondary to that of the naso-pharynx. The way in which this was brought about was by means of lowering the general health, and by the actual extension of the inflammatory process up the nasal duct, in much the same way as the Eustachian tube was affected by throat conditions and deafness was produced.

Dr. A. H. Benson (Dublin) read a paper on **evolution in blepharoplasty.** He pointed out that in Ireland entropion and trichiasis were amongst the commonest of eye troubles following trachoma, and as they were the cause of so much misery and damage to sight it was of the highest importance to find out and adopt the best method for dealing with the condition.

Of the hundreds of operations proposed and practised, but few gave satisfactory results, and many of them were objectionable and injurious.

He then traced the various operations that had been employed from the earliest days for its relief, beginning at the old operation of cutting off the margin of the lid, hairs and all. The relief was of course immediate, but it caused so much shortening of the lid that the cornea was never again completely covered, dirt got in, and a condition of xerophthalmia resulted so that the last state of that eye was worse than the first. This had to be given up.

The next thing was that the cilia themselves only were excised. This was a great advance, but it likewise produced great shortening of the lids, and it also was abandoned.

Now every effort was made to retain the cilia, and numerous operations were devised to effect this end; they mostly had for their object the shortening of the skin to make it the same length on the outer side as on the inner. However two wrongs could not make a right, and these were all found to be wanting and were more or less abandoned.

They then split the lid horizontally, leaving the cilia in the anterior flap, removed a piece of skin, and stitched the flap containing the lashes away from the eyeball, but here again the design was faulty and they took away what should have been left.

The next stage marked an entirely new era. The piece of skin which had up to this time been removed was now transplanted into the raw surface beneath the cilia, and the lid was not short-

ened, and nothing was thrown away. Every one thought that perfection had been reached and the results were infinitely better, but still skin is not mucous membrane and did not act well as such, and the skin had hairs on it, which, although not coarse ones, did yet cause some irritation. Rabbits' conjunctiva was substituted, but with poor results, and finally the mucous membrane of the patient's own lip was transplanted, and this is the latest and by far the best method yet adopted. He described in detail what he termed the St. Mark's operation, for it was devised and the details were elaborated at that hospital, and he consided it the simplest and most satisfactory of all the operations. If the flap be carefully laid down on the place made for it, and there sutured, there was little or no risk of its sloughing. Care should be taken not to make the flap of mucous membrane too large, for it does not shrink like skin, and it should only just fit, or be a trifle smaller than the place it is intended to fill; slight stretching does no harm. It is also quite unnecessary to wait for the bleeding to stop before applying the flap; the bleeding does no harm if the flap is fixed. The operation is equally applicable to both upper and lower lids and to all varieties of entropion. This operation he stated had been performed for the last twenty-one years at St. Mark's Hospital, and yet but few seem to know much about it. When once the result had been obtained it was permanent, for the flap did not shrink, but remained without perceptible change for years.

Remarks were made by Professor HESS, Dr. HENRY, Mr. TATHAM THOMPSON, the PRESIDENT, Dr. CECIL SHAW, and Mr. LAWFORD.

Dr. BENSON in reply said that in his experience when a skin flap was transplanted it never ceased to cause irritation by reason of the hairs on it, and the disintegrated epithelium, which even after many years remained the same, and the only condition which might cause it to cease to be annoying is when partial sloughing of the surface of the flap took place. By modifications in detail it could be made suitable for all degrees of the affection.

The President (Dr. G. A. BERRY) read a paper on a **new test for visual acuteness.** He stated that there were two points which could hardly yet be said to be definitely settled. The one had reference to the scale according to which fractional amounts of the full normal standard should be estimated. The other

took into consideration the nature or configuration of the test objects which might be most suitably used when the scale had been decided upon. Although the usual method of representing vision according to the angle subtended by the test object was scientific and fairly accurate, yet it was far from representing in a satisfactory manner what he referred to as the scale of efficiency. In any scheme devised it was necessary that it should be correlated in some way to the ordinary scale of visual acuteness, and also it must admit of some degree of variability or elasticity so as to meet the requirements of varying conditions.

For ordinary purposes Snellen's types were the best we possessed, but there were certain defects which might be eliminated by another method more suitable for particular cases; these defects were mainly that all letters were not equally legible, and that when once read and recognized they were easier to read a second time, they were altogether unsuitable for children and illiterate people, and those devised for the latter class were not suitable for the former.

In order to obviate these disadvantages he had devised a method of using a number of alternating black and white squares of the same size as the spaces left in Snellen's letters but covering a considerable area, and the way in which these were seen depended upon the distance they were from the eye. The size of the squares he used were 1, 2, 3, 6, and 12*mm*, subtending angles of 1, 2, 4, 8 at 5 metres. At and beyond some particular distance, according to the acuteness of sight, these surfaces no longer appeared checked, but either ran into lines or looked uniformly gray; the appearance of lines was due to astigmatism, which lines run parallel with the diagonals of the squares. The most convenient way was to mount several circular patches made up of squares of different sizes on a disk, as well as other gray circular patches which could be used for controlling the patient's statements. A test like this would no doubt be useful for anthropological researches, for an intelligent savage with a piece of paper printed with squares in one hand and another piece gray in the other, could readily indicate whether the disk pointed to resembled one or other piece of paper he was holding; children also could do this if unable to read. In addition it showed at once slight degrees of astigmatism.

REPORT OF THE THIRTY-SECOND MEETING OF THE GERMAN OPHTHALMOLOGICAL SOCIETY AT HEIDELBERG AUGUST 3 TO 5, 1905.

REPORTED BY DR. TREUTLER, DRESDEN.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

(*Continued from vol. xxxiv., page 671.*)

DEMONSTRATION SESSION, AUGUST 4TH, 3 P.M., DR. ROGMAN PRESIDING.

A few demonstrations illustrative of the papers which had been read were made.

4. CZERMAK exhibited a **small blind eye in which the lens was replaced by a fibrous, vascularized pseudolens.** The pupil was secluded, and there was a glaucomatous excavation of the optic nerve. He sought to demonstrate anatomically that the lenticular condition was congenital. Grothad described a similar case as cataracta congenita vasculosa.

5. K. RAEHLMANN. **Amyloid degeneration of the lids and conjunctiva.** Like glycogen, which as an intermediate stage between albumin and sugar is a normal constituent of the body, amyloid belongs physiologically with the albumenoids, but chemically with the carbohydrates. Amyloid degeneration is frequently associated with colloid and with mucous transformation. To demonstrate such degeneration histologically, a double staining with eosin hæmatoxylin is recommended in addition to the reaction of iodosulphuric acid, methylviolet, etc. The histological process through which all these transformations of the albumin of the normal tissue pass into allotropic forms, takes

place exclusively under the influence of the presence of ferments, *i.e.*, other forms of albumin foreign to the tissue. According to Redner's ultramicroscopic researches regarding the solution of albumin and its transport in the body, these ferments are not dissolved, but are held in suspension in the tissue fluids. Through the union of these ferments with the local albumin, or with the products of its destruction, new allotropic albumenoids are formed which have a different molecular composition and chemical reaction. Under the ultramicroscope, the change of the tissue albumin into albumose or pepton, as well as the process of the change of glycogen into sugar, can be observed. The substratum of glycogen, which is nearly related to amyloid, is formed of little, plainly visible, spherical, gray bodies, which, after the addition of the diastase, diminish in size, become broken up into minute particles, and gradually disappear under the eye of the observer. As long as the solution contains these spherical bodies its chemical reaction is that of glycogen, but after these spherical bodies have been destroyed and have disappeared it is that of sugar. It may be *a priori* conjectured that similar changes take place in amyloid, and it must then be assumed that the cause of the transformation of the local tissue albumin into amyloid is the introduction of a molecule of albumin which acts as a ferment. This theory is supported by a series of microscopical conditions. In the first place, at the beginning of amyloid degeneration, even before the appearance of the characteristic reaction, fine, dust-like granules may be seen in the affected tissue. When the degeneration in the cellular tissue of the conjunctiva begins just beneath the epithelium, the cells can sometimes be seen to be filled with granules, which must be looked upon as a transformation of the cell albumin, but partly also as constituents which have entered and promote the transformation of the albumin. This is supported by the fact that in the commencing formation of lamellæ about the foci of amyloid numerous little globules, scarcely visible with the ordinary microscope, are found between the cells.

These granules are very frequently found within the nuclei of the affected cells, sometimes confined to them, and then the nuclei are filled with larger and smaller globules, as in karyokinesis.

That these granules introduce the commencement of the formation of amyloid may be proved by the chemical reaction. In

some of the specimens exhibited there were within the cells only occasional globules stained blue, in others single granules within the nuclei had undergone amyloid degeneration. Hence the nucleo-albumin of the cell nucleus may alone degenerate, or the albumin of the cell protoplasm, or the albumenoid of the connective substance degenerate as well. Whether the degeneration affects the one or the other albumenoid evidently depends on the chemical or physical affinity of the latter to the ferment.

A granular change in the cells is also to be observed in hyaline and colloid degeneration, very similar to that produced by the presence of glycogen in cellular tissue.

Traina and Ziegler have recently described almost exactly similar granules as regularly present in the glandular cells of different organs, and have demonstrated them to be particles of fat.

The single cells come to degeneration by confluence of the degenerated little corpuscles, and the formation of layers results from the confluence of the cells, but the contents of an apparently homogeneous cell or layer is still in truth granular, as is shown by the ultramicroscope.

As clinical experience teaches that amyloid developed locally on the eye may undergo complete retrogression with return to the original tissue, there remains necessary for the explanation of this process only the theory that during the condition of degeneration the original unity of tissue is preserved, at least chemically. The change of the amyloid into the original tissue albumin may then follow the scheme of removal which has been observed ultramicroscopically in the isomeric glycogen.

6. FLEISCHER (Tübingen). **Family degeneration of the cornea.** After a review of fifty-nine cases hitherto described, including both the macular and lattice-like opacities of the cornea, Fleischer reported twenty-four cases which had been observed in the clinic at Tübingen. He showed that most of these cases came from within a certain district in Swabia, but had not discovered the cause why it infested this region. Consanguinity did not appear to be present, but the author was inclined to believe that it existed. All the cases were of the macular form. In many cases the periphery was the part less affected, but it was never uninvolved. The deposits lie in the different layers of the cornea, and trouble is caused only by those situated superficially.

The disease usually begins in the first decade of life. Six cases were exhibited which differed from the hitherto described form in that the changes were ring-shaped, and this new variety of the disease was denominated annular. The author considers the disease degenerative, and cannot convince himself that it is of tuberculous nature.

Discussion.

GOLDZIEHER had seen a similar case, in which the epithelial cells were much enlarged.

DEUTSCHMANN referred to his own former publication on unfamiliar corneal diseases.

7. VON REUSS exhibited preparations of the **posterior capsule of the lens with an abscess of the vitreous,** which had resulted from a double perforating injury with a sliver of iron. The course of the iron was such that a direct injury of the capsule could be perfectly excluded. The conclusion of the writer, based on the microscopical condition and the writings of others, was that the perforation of the posterior capsule was due to the action of the pus and bacteria coming from the ciliary body or vitreous.

8. HALBEN. **Differential refractometer.** The best researches hitherto have given only an imperfect picture of the optic stratification of the lens. The anatomical deductions from fresh lens masses of prescribed form, size, and position are inexact and uncertain. Then there are changes of index from loss of water. As the masses crushed between the prisms of Abbe's refractometer are not optically homogeneous, the border line of total reflection appears indistinct and the index not exactly determinable. The formation of an indicial curve from these few uncertainly measured index values of uncertainly prepared masses of lens is crude. Since I demonstrated refractometrically for pseudo-cataracts and black cataracts that undue increase of the index of the lens can easily produce serious disturbances of vision like those induced by cataract, I have undertaken the construction of an instrument with which the refractive index of the smallest portion desired of an uninjured fresh section of the lens in situ could be determined. The tube of an Abbe's refractometer over the ocular is prolonged, and in this, by means of a freely movable perforated shutter within a right-angled coordinate system, the smallest diameter desired can be isolated in

sectional zones following each other at a distance of $\frac{1}{2}mm$ in the suspended inverted picture of the section without moving the object itself. The indices of all these points are easily read and are used as ordinates in the sketch of the indicial curve. As a control observation, the sites of the highest and lowest indices are sought out by means of the shutter, together with as many intermediate isoindicial zones as may be desired. In this way is obtained a diagram of the optic density of the lens from its centre to its periphery, which shows a surprisingly great total amplitude between the highest and the lowest index, and almost always greater decrease of index in places on the anterior and posterior margins of the nucleus. These observations deprive Mathiessen's teachings of their value and render necessary a revision of the teaching regarding the total index.

THIRD SESSION, AUGUST 5TH, 9 A.M., DR. SCHLEICH PRESIDING.

17. ZUR NEDDEN (Bonn). **The removal of deposits of chalk and of lead from the cornea.** Chalky deposits in the cornea contain no albuminate of calcium, because calcium and albumin have very slight chemical affinity for each other, but contain calcium carbonate, while, on the contrary, the deposits of lead contain at first not the carbonate but the albuminate, because lead and albuminate have a great affinity for each other. Still the albuminate of lead becomes gradually transformed through the action of CO into the carbonate. Therefore any chemical means employed to remove lead and chalky deposits must be able to dissolve both the albuminates and the carbonates. Several neutral ammonium salts fulfil this condition, and are equally good for the removal of chalk, while ammonium tartaricum is the best for the removal of lead. The removal of incrustations of lead from the eyes of living rabbits by means of tartrate of ammonium was successful only when the incrustations were fresh and contained little carbonate. With chalky deposits, on the contrary, improvement could be obtained on the living eye, even after the lapse of years, through the use of ammonium salts, of which tartrate of ammonium had proved the best. In seven cases of incrustation of chalk on the human eye a noticeable improvement was twice obtained by the application of ammonium chloride, as recommended by Guillery. In a case of lead incrustation, treated three times a day for three quarters of an hour each time

with ammonium tartrate, the very thick opacity of the cornea passed nearly away in the course of seven weeks, and the vision became greatly improved.

18. H. E. PAGENSTECHER (Heidelberg). **Corneal opacities due to the action of quicklime.** The author sought to demonstrate analytically that the primary opacities of the cornea cannot be explained by the action of solutions of calcium salts, either as a deposit of carbonate of lime or of phosphate of lime, or by the deposit of a calcium albuminate insoluble in water in the corneal tissue. He thinks that the porcelain-like opacities caused by the presence of lime in the corneal tissue are due to the union of the lime with the collagenous substance.

19. TH. LEBER (Heidelberg). **The metabolism of the crystalline lens.** As the result of his experiments, Leber has come to the conclusion that the molecular constitution of the substance taken up and the selective power of the lens determine the degree and duration of the process. One of the most important parts of this selective action seems to be the affinity of the lens for soluble lipoid substances, the admission of which in the serum is perhaps favored by the increase of lecithin and cholestearin in the lens.

20. HESS and ROEMER (Würzburg). **Elective functions of the pigment epithelium in the retina.** Römer and Hess have made use of the results of the serum investigation in the study of the functions of the pigment epithelium and of the retina. Römer spoke first of the relations of the pigment epithelium to constituents of the normal serums. The single question studied in 104 experiments with eight different kinds of normal serums was in what way the actions of the normal serums demonstrable in the test-tube are influenced by the pigment epithelium and retina of swine and cattle. These revealed curious elective functions, *e. g.* the hæmolysins of the normal serums. The individual hæmolysin of the normal dog serum is influenced very differently by the pigment epithelium. The lysin of the blood corpuscles of cattle is completely agglutinated, others are not influenced at all. In this way it can be determined whether certain pigment epithelium in a test-tube came from swine or cattle. These investigations give a very interesting insight into the elective functions of these structures, which renders possible a further advance in our knowledge of their physiology and pathology.

Hess reported a series of experiments from which it was learned that the introduction of perceptive retinal elements into the peritoneal cavities of guinea-pigs was productive of antibodies which were specifically injurious to the rods. The work preparatory to these experiments consisted of an investigation of the behavior of fresh rods in salt solutions of different strengths, which showed that in salt solutions of 0.4 % and less the fresh rods almost instantly rolled themselves together into spherical and annular structures, while in stronger solutions they maintained a form approaching the normal for a longer time. The temperature had an important influence on the signs of degeneration which could be observed in the latter case.

Discussion.

ROSENMAYER sought to know whether pus-exciting micro-organisms multiplying only in the uveal tract area so changed during life that they acquire specifically deleterious relations to the uveal tracts of the genus of animals affected. The cultures of staphylococcus bred by Professor Neisser in the ciliary bodies and pigment epithelium of rabbits died and these toxines were introduced into the circulation of rabbits. Both animals experimented on showed foci of infiltration and diffuse proliferation of pigment in each eye. If this condition is constant, the specific relation of certain organisms to the uveal tract will furnish the key to the explanation of the occurrence of sympathetic ophthalmia.

21. TH. LEBER (Heidelberg). **Filtration from the anterior chamber.** The author and Dr. Pilzecker have undertaken some new experiments with the filtration manometer in regard to the different influences which govern the normal filtration of the eye. They used a 1 % solution of chloride of sodium, which is identical with the aqueous and not markedly different in its viscosity. The temperature of the fluid was found to have great influence on the filtration. The warming causes the fluid to pass more readily from a decrease of its so-called viscosity. The quantity of fluid which enters an eye under a constant pressure depends not only on the degree of the pressure but also on the condition of tension present in the eye. This explains why in an enucleated eye, the tension of which has been brought again to normal, the entrance of fluid is at first rapid and then gradually decreases so that often

a long time intervenes before it becomes constant. These and similar observations permit the assumption that the fluid which entered the eye during the experiment does not always escape completely through filtration, but remains in part therein, and that by a gradual bending or stretching of the wall space is created. Experiments on the capsules of eyes which have been emptied and filled with mercury have confirmed this theory. Although a filtration outward of the contents was thus completely prevented, yet fluid entered the eye not only during the first minute, but also for a long time afterward, though in less and rapidly diminishing quantity, the pressure remaining constant. If in an experiment the entire amount of supplementary fluid which would enter the eye in an hour should be pressed in quickly, the pressure would require to be more than doubled. To confirm this result, the fluid which enters and the filtrate which exudes from the eye should be accurately measured, while the weight of the eye should be determined both before and after, as well as sometimes at regular intervals during the experiment. This shows that only a part of the fluid which enters the eye in the course of one or two hours, at most something over a half, sometimes only one-third or one-quarter, escapes through filtration, and that the remainder remains in the eye. The diminution of the fluid entering which occurs during the experiment is because the increase in volume which is considerable at first becomes gradually less and finally disappears. The filtration, on the contrary, gradually increases during the experiment.

In order to obtain as accurate a measure of the filtration as possible, the relaxation of the eyeball which follows the death of the animal must be avoided. This is accomplished in rabbits by the introduction at the moment of death of sufficient fluid into the eye to maintain its tension at its former height, and at the same time the cooling of the eye is prevented.

The most noteworthy result thus far obtained is that there is no such fixed relation between the tension and the fulness of the eye as has hitherto been represented. The peculiar elasticity of its walls permits the eye to accommodate itself to great changes in the size of its contents without producing any marked change in its tension. Herein lies a protection against the action of causes which tend to increase the tension. As this protection must diminish as the rigidity of the sclera increases, a better explanation

is furnished of the greater predisposition of age to glaucoma than we have hitherto had.

22. RÖMER (Würzburg). **The aggressines of pneumococci in the pathology of ulcus serpens.** Römer reported further progress both as regards the pathology of ulcus serpens and as regards the serum therapy. Two points have hitherto been unsatisfactory: the lack of a valuation of the serum, and the uncertainty whether the different stocks of pneumococci taken from these ulcers differed so much from each other biologically as to limit the value of the serum. The author claims that it is quite possible to determine the protective value of the serum, although on account of the lack of any control it has been doubtful whether the individual serum tests have always contained a satisfactory protective value, and that this evil may be corrected by placing the proving of the serum in the hands of the State. The aggressines of the pneumococci are of the greatest importance in the development of ulcus serpens. These substances, which may be obtained for the purpose of study from inflammatory exudates, enable the pneumococci to develop in tissue, and the malignity of an ulcus serpens is directly proportional to the ability of the pneumococci to supply these substances in large quantities in the animal organism. All stocks of pneumococci taken from ulcera serpentia produce these specific substances. The proof of this is that an animal may be rendered immune against a very virulent stock of pneumococci by the aggressines of various other stocks. This proves the biological homogeneity of the different stocks of pneumococci and also opens a wider perspective for serum therapy.

Discussion.

MAYWEG reported eighteen cases of ulcus serpens which he had treated with Römer's serum. He advocated the method, which had given particularly good results in the early stages of corneal disease.

SATTLER had treated two mild and ten severe cases of ulcus serpens with dead cultures of pneumococci according to Römer's method. The former recovered, but of the latter four improved temporarily while six were not affected.

23. H. ULBRICH (Prague). **Tetanus infection of the eye.** Some cases of tetanus have been reported which were compli-

cated by injuries of the eye, but in the majority the injury of the eye could not be considered of etiological importance. Hitherto there has been nothing published regarding the behavior of the tetanus bacillus in the eye. In the eyes of rabbits the tetanus bacillus behaves the same as in the bodies of rabbits—*i. e.*, when injected in pure culture it does not develop well and the animals do not get tetanus. On the contrary, the local signs of inflammation which follow any intraocular injection of bacteria accompanies the infection of the eye with tetanus. Eight days after the infection of the anterior chamber the tetanus germs are still present in the aqueous, and after five weeks they may still be obtained by culture from the iris. It is almost hopeless to search for the tetanus bacillus in the eye by means of the microscope alone; it can only be demonstrated by means of cultures.

Discussion.

WAGENMANN reported a case of tetanus after a stab wound of the orbit.

24. DA GAMA PINTO (Lisbon). **Plastic surgery of the lid.** Ectropion caused by malignant pustule is common in Portugal. To replace the lid, da Gama Pinto uses a non-pedicled flap of the skin. The use of pedicled flaps takes too much time and is too disfiguring. Thiersch grafts wither quickly and are disappointing. He takes the flap from the inner side of the upper arm or of the thigh, or better yet from the prepuce, the sole disadvantage of which is its somewhat dark color which tends to become still darker. The point of chief importance about the operation is that everything connected with it, hands, instruments, field of operation, sponges, bandages, all must be absolutely dry. This favors the quick union of the flap and insures a good result. Thirteen successful cases out of a total of fourteen operations. Foreskin used three times.

Discussion.

BIRCH-HIRSCHFELD recommended Budinger's tarsoplastic operation, flap taken from the cartilage of the ear, to restore total loss of the lid.

TRANSACTIONS OF THE TWENTY-SECOND ANNUAL MEETING OF THE FRENCH OPHTHALMOLOGICAL SOCIETY, MAY 1–4, 1905.

REPORTED BY DR. E. BERGER, PARIS.

Translated from the *Arch. f. Augenheilk.*, Vol. LII., Sept., 1905, by Dr. MATTHIAS LANCKTON FOSTER.

BOURGEOIS (Rheims). **Report regarding the full correction of myopia.** Most ophthalmologists consider that the great effort at convergence is the chief factor in the origin and increase of myopia. Full correction has a favorable influence on myopia and retards its increase. It is still a question whether the full correction is advantageous in malignant myopia. Even a myopia of very low degree should be corrected in children in order to prevent its increase. For young people the full correction of myopia of low or medium degree may be prescribed at once, but it is better to partially correct the higher degrees and gradually increase the strength of the glasses until the full correction is worn. For myopia over twelve dioptres no general rule can be formulated. Even slight degrees of astigmatism should be corrected at the same time. In anisometropia the subjective tolerance of the patient must determine whether the full correction should be prescribed or not. Decentred lenses should be used only in concomitant insufficiency of convergence. During school life the glasses should be large, periscopic, and either round or slightly elliptical. In progressive myopia the general condition of the child should be carefully inquired into.

BOURDEAUX,[1] B. **Convergence in corrected myopia.** By means of Remy's diploscope it is shown that most myopes have not normal binocular vision when their refractive errors are fully corrected, and that they converge strongly. They have to

converge strongly to obtain binocular vision for distance, and this convergence is increased when the myopia is fully corrected. Bourdeaux thinks that the dizziness, diplopia, and headache which have been observed many times after full correction of myopia depend on this strong convergence.

TSCHERNING (Paris). **Orthoscopic lenses.** Marked spherical aberration and astigmatism are produced by moving a bi-convex or a bi-concave lens so that the visual line passes through its peripheral portion, and bi-convex lenses narrow the visual field. Hence such lenses should not be used either in the trial case by the physician, nor worn by patients. To avoid these faults, Tscherning has prepared a test case of periscopic and plano-spherical lenses, the latter for use when a sphero-cylindric combination is desired. The plano-spherical lenses may be prescribed for ± 3 dioptres or less instead of the periscopic.

ANTONELLI (Paris) prefers the plano-spherical to the periscopic lens because the latter are too heavy and too expensive. In combining sphericals with cylindricals, if a convex cylinder is ground on the anterior surface of a concave lens, and a concave cylinder on the posterior surface of a convex lens, the distance of the cylindrical surface from the eye may always be calculated. In high myopia, plano-concave lenses give much better results than periscopic.

JAVAL (Paris). **Writing and myopia.** Javal recommends as a preventive of myopia that vertical writing should be taught in the schools.

SULZER (Paris). **The origin of the prejudice against glasses.** From the fifteenth to the middle of the nineteenth century glasses were fitted only by the dealers. The Faculty of Medicine at Paris excluded all who were engaged in prescribing glasses. Only a few scholars had access to the works of Roger Bacon, Descartes, Keppler, and Lahire on the subject. Up to the middle of the last century ophthalmologists opposed the wearing of glasses and were accustomed to ascribe almost every disease of the eye to their previous use.

TRUC (Montpellier). **Inspection of the eyes of school children in Montpellier.** The light was found to be faulty during the day in many schools, but good at night in most of them. The seats and desks were criticised. 6445 school children were examined. Myopia was present in from 8 to 12 per cent.

VALUDE (Paris). **Ophthalmia nodosa.** Valude observed a case of this disease which was caused by a caterpillar thrown against the cornea. A large number of little gray, superficial nodules were found on the cornea. Recovery was rapid under a moist dressing.

ROLLET and AURAND (Lyons). **Experimental keratitis aspergillosa.** The aspergillus fumigatus produces experimentally the most intense changes in the cornea. The other forms of aspergillus have a less deleterious action.

DESCHAMPS (Grenoble). **The influence of subconjunctival injections on the curvature of the cornea and on astigmatism.** Deschamps claims that corneal astigmatism may be influenced by subconjunctival injections, and recommends their use for this purpose. The injections should be made as close as possible to the margin of the cornea.

DEMETS (Antwerp). **Ill-timed methods of treatment.** Demets believes that too many and too energetic medicaments are used in ophthalmology, and would substitute the use of protargol for that of silver nitrate.

ARMAGNAC, LAGRANGE, and WICHERKIEWICZ consider that the use of silver nitrate is indispensable in ophthalmology, but that one should know how to use it rightly.

DARIER (Paris). **The use of radium in medicine.** Radium is analgesic, alleviates convulsions and spasms, and stimulates the motor and sensory nerves. It is therapeutically indicated in superficial epitheliomata, trachoma, episcleritis, vernal catarrh, and intraocular hemorrhages.

WICHERKIEWICZ and VALUDE have seen no result from the use of radium in epithelioma of the lid, but have observed the disappearance of papilloma of the conjunctiva after the application of radium rays.

DUBARRY and GUILLOT (Havre). **Treatment of choked disk by trephining.** After lumbar puncture has failed, the skull may be trephined and the dura incised. Puncture and drainage of the ventricle are objectionable.

LAGRANGE (Bordeaux). **Improvement of the prothesis by transplantation of a rabbit's eye.** According to the method recommended by Chibret, the eye of a rabbit was transplanted into Tenon's capsule, with its cornea directed backward. The

ocular muscles were then united over it, and then the conjunctival wound was closed.

ROHMER, MOTAIS, VALUDE, and ARMAGNAC spoke in opposition to this method, because it does not furnish a movable stump, and therefore does not increase the mobility of the artificial eye.

CHEVALLEREAU (Paris). **Combined transverse keratotomy.** In order to obtain a good stump for an artificial eye, in many cases of corneal staphyloma the cornea may be split transversely, the iris and lens removed, and then a pressure bandage applied.

TEILLAIS (Nantes). **A new ocular symptom in Basedow's disease.** A dark discoloration of the lids, which appears simultaneously with the other symptoms of the disease. The writer observed this symptom at the same time as Jellinek and Rosin, but the latter secured earlier publication.

CHAILLONS (Paris). **Differential diagnosis between Parinaud's infectious conjunctivitis of animal origin and tuberculosis of the conjunctiva.** The clinical symptoms of these two diseases of the conjunctiva are so alike in many cases that they can be differentiated only by the microscopical examination. Giant cells are never found in the nodules of Parinaud's conjunctivitis, while they are almost always present in conjunctival tuberculosis. The diagnosis may also be made by experimental inoculation of the lower animals, because in them the tuberculosis is easily recognized.

TERSON, A. (Paris). **Gumma of the cornea.** A woman, twenty-two years old, who had hereditary syphilis, suffered first from parenchymatous keratitis. Four years later she had a severe iritis and a yellowish prominence to the temporal side of the centre of the cornea, which Terson diagnosed as a gumma. It became absorbed without ulceration after four injections of calomel. In late hereditary syphilis, gummatous nodules have hitherto been observed only in the lids, conjunctiva, lachrymal apparatus, and ciliary body.

AUBINEAU (Brest). **The difficulty in the diagnosis of the syphilitic origin of an iritis.** When a syphilitic iritis is not associated with the formation of papules or condylomata its syphilitic nature can be drawn only from the history. The author believes there are mixed forms, in which accompanying secondary

infection contributes to the production of an iritis and influences the clinical symptoms.

ROLLET (Lyons). **Tarsitis tuberculosa.** Tuberculous tarsitis may present the clinical symptoms of a chalazion, or may appear as an indolent swelling of the whole of the tarsus, which may be associated with tuberculosis of the skin and swelling of the glands. It causes a slight ptosis and a chronic hyperplasia of the lid. There is some clinical resemblance to syphilitic tarsitis. Treatment consists in curettage, deep incisions, and the actual cautery.

VILLARD (Montpellier). **Acute glaucoma caused by contusion of the globe (traumatic glaucoma).** Villard adds three new cases of traumatic glaucoma to the twenty-one already known. One case recovered completely, in the other two there was complete, or almost complete, loss of sight. He recommends treatment first with myotics and quinine, then paracentesis or anterior sclerotomy, and in case all these fail, iridectomy.

MOISSONIER (Tours). **Primary tuberculosis of the conjunctiva.** Moissonier observed a case in which there were reddish granulations and a large oval ulceration of the conjunctiva. Treatment effected a cure of the conjunctival affection but the tarsus became involved.

DUPUY-DUTEMPS (Paris). **Recurrence of an epithelioma of the lachrymal gland.** The lachrymal gland was extirpated on account of an epithelioma. Sixteen months later there was a recurrence, on account of which the orbit was eviscerated. The histological condition was that of an epithelioma with carcinoma in places.

FROMAGET (Bordeaux). **Radical operation for dacryocystitis.** Fromaget unites three different operations to secure the complete healing of a chronic dacryocystitis, extirpation of the lachrymal sac, curettage of the lachrymo-nasal canal, and removal of the lachrymal gland.

GOURFEIN (Geneva). **Diagnosis of tuberculosis of the iris by means of puncture of the anterior chamber.** In cases of tuberculosis of the iris the diagnosis may be confirmed by inoculation of animals with aqueous obtained from the anterior chamber.

ROHMER (Nancy). **Meningocele of the orbit.** A symmetrical tumor, occupying the nasal side of the orbits, was observed in

an eight-month-old child. The right tumor was removed without accident, and the pathological examination showed it to be a meningocele. Removal of the left tumor was followed by meningitis.

Cosse (Tours). **Melanosarcoma of the choroid and the manner of its extension to the orbit.** In Cosse's case a sarcoma of the choroid spread first to the iris and thence by way of Schlemm's canal to the sclera, the conjunctiva, and finally to the orbit. In the posterior segment of the globe the sclera and optic nerve were not involved by the tumor.

Condron (Lorient). **A case of primary lymphosarcoma of the orbital lachrymal gland.** By means of Kroenlein's operation, an orbital tumor was removed from a man eighteen years old, which projected beyond the upper internal margin of the orbit. Microscopical examination showed that it was a lymphosarcoma, which sprang from the capsule of the lachrymal gland. The tumor recurred a few months after the operation.

Terrien (Paris). **A bright plate for the investigation of the visual field.** A demonstration of a bright plate which serves for the determination of central and peripheral vision and the fields for colors.

Antonelli (Paris). **Orbital abscess and purulent inflammation of the lachrymal gland due to an otitis media following grippe.** In a girl eleven years old, an attack of influenza was followed by a purulent otitis media, which resulted in an orbital abscess and a purulent dacryo-adenitis. Antonelli ascribes it to a direct passage of the pus from the tympanic cavity by way of the Gasserian fissure and the petro-tympanic suture to the pterygo-maxillary fossa, and thence through the sphenomaxillary fissure along the outer wall of the orbit to the lachrymal gland.

Pechin (Paris). **A conjunctival inflammation of the new-born of lachrymal origin.** There is met with in new-born infants a conjunctivitis with muco-purulent secretion which is not improved by lavage or astringent collyria, because it is caused by an obstruction of the lachrymal passage, and therefore can be cured only by opening the passage either by injection or the passage of a catheter.

Galezowski, Jean (Paris). **The evolution of amaurosis in tabes.** Amaurosis usually appears after some months, more

rarely after some years. Total blindness comes on slowly, because the two eyes do not become subject to atrophy simultaneously, as a rule. Out of ten cases of absolute bilateral amaurosis, the blindness came on in only one after six years; the course was usually more rapid—four years, three years, or only a few months.

COLOMB (Geneva). **Congenital dermoid tumors of the ocular conjunctiva and of the cornea.** Colomb has observed three cases in which the dermoid character was demonstrated. They were associated with other congenital malformations.

DUPUY-DUTEMPS. **A peculiar atrophy of the iris due to tabes and progressive paralysis; its relations to the irregular form and the anomalies of the reflex movements of the pupil.** Dupuy-Dutemps has observed in tabes and in progressive paralysis a partial atrophy which affects only sectors of the iris. The pupil is broadest at the place where the iris is atrophic. This explains the irregular form of the pupil in progressive paralysis and its elliptical form in tabes.

The absence of the light reflex of the pupil is also a symptom of the atrophy of the iris. When the reflex of the pupil to accommodation, or when Galassi-Piltz's reflex is absent, the presence of atrophy of the iris can always be demonstrated.

This atrophy of the iris is never the result of iridoplegia whether of nuclear or of basilar origin. It occurs rather in consequence of a lesion of the peripheral neurones of the ciliary nerves, the twigs of which innervate the sectors of the iris, so that in this way the sector-shaped form of the atrophy is also explained.

CAPMAS (Orleans). **Non-magnetic foreign bodies in the posterior segment of the eyeball.** The position of a bit of stone in the posterior part of the eye was determined by means of the X-rays, and it was then extracted successfully.

DESVAUX (Angers). **Two cases of spontaneous hemorrhage into the vitreous.** Without known cause hemorrhages took place into the vitreous of a young person twenty years of age, and into that of an old man. In spite of the general treatment which seemed to be indicated, blindness resulted in each of the affected eyes.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FOURTH QUARTER OF THE YEAR 1904.

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Translated by Dr. PERCY FRIDENBERG, New York.

Sections VIII.–XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

624. GALLENGA, C. **Unusual frequency of palpebral phlegmon in the summer of 1904.** *La clinica oculistica*, Oct., 1904.

625. ERDMANN, P. **A case of marginal chalazion.** *Arch. f. Augenheilk.*, li., 2, p. 171.

626. YAMAGUCHI, H. **Syphilitic tarsitis simulating amyloid degeneration.** *Arch. f. Augenheilk.* li., 1, p. 8.

627. LAGLEYZE. **Operative treatment of entropion and trichiasis.** *Arch. d'opht.*, xxiv., No. 12, p. 773.

628. SOMMER, G. **Primary melanosarcoma of the eyelids.** *Wochenschr. f. Therap. u. Hyg. d. Auges*, No. 52, 1904.

629. HANKE, V. **Plexiform neuroma of the lid.** *v. Graefe's Arch. f. Ophthalm.*, lix., 2, p. 315.

GALLENGA (624, **frequency of palpebral phlegmon in summer, 1904**) saw, in the months of July and August alone, twelve cases of phlegmonous abscess of the lids, all in boys of the poorer class from five to ten years of age. Bacteriologic examination showed staphylococci in ten, streptococci in two cases. The

abscesses are due to infective skin diseases, which are frequent during the heated term, and caused by high temperatures combined with neglect of personal cleanliness. CIRINCIONE.

ERDMANN (625, **marginal chalazion**) saw in a patient with eczema and ectropion of the lower lids, a number of small nodules, one to two *mm* in diameter, on the margin of the upper lid, and corresponding to the absent openings of Meibomian glands. They were found, microscopically, to be composed of granulation tissue of degenerated follicles, *i.e.* chalazia. The latter are not to be looked upon as sebaceous cysts but as analogous with the pustules of acne vulgaris hypertrophica.

YAMAGUCHI (626, **syphilitic tarsitis**) reports the case of a woman aged fifty-six, without signs of syphilis, whose conjunctiva bled freely at the slightest touch. Nodules of a gristly hardness developed in the upper lid and made it more and more difficult to open the eye. A diagnosis of amyloid degeneration was made. The conjunctival hemorrhages and nose-bleed, which had also been present, finally ceased, leaving adhesive bands in the nasal cavities and between the lid-margins, as well as entropion. After treatment lasting more than six months, a blepharoplastic operation was done, and the nodules shelled out. These were found to consist of dense connective tissue like that of the tarsus, with syphilitic endarteritis obliterans and periphlebitis. There was no amyloid reaction.

LAGLEYZE (627, **operation of entropion**) has cured more than 300 cases of entropion and trichiasis of both lids in the following manner: A silk suture is armed with five or six curved needles, 3*mm* long, which are inserted at equal distances into the conjunctival aspect of the ectropionated lid, directly behind the upper margin of the tarsus, and brought out in the skin of the lid. With the needles in situ, an incision is made parallel to and 3*mm* from the lid margin, through conjunctiva and cartilage. The needles are then removed, leaving four sutures which are tied over a pledget of gauze on the lid margin, and removed in seven or eight days. The operation is simple and efficacious, and painless if subcutaneous injections of cocaine and adrenalin are used. v. MITTELSTÄDT.

SOMMER (628, **primary melanosarcoma of eyelids**) reports a case of melanosarcoma of the edge of the upper lid in a patient of eighty-two, which had been present five years, bled rarely,

caused no metastases, and had proliferated into the bulbar conjunctiva after some emigration of pigment.

HANKE (629, **plexiform neuroma of lid**) describes plexiform neuroma, which has a predilection for the eyelids, as a soft, diffuse growth which may have lobulated attachments. In these, hard, convoluted strands may be felt. The tumor is never malignant, but often causes pressure necrosis of neighboring bone. It is often congenital and inherited, appearing in childhood or at puberty. After traumatism or operative interference, rapid growth may be observed. The swelling yields to pressure and shows spontaneous variations like those of lymphangioma. Complete extirpation is difficult as the growths are not well defined. Histologically, numerous nerve fibres are found, with endo- and peri-neural proliferation, endothelial degeneration, and myxomatous changes in the connective tissue and nerve-trunks.

IX.—LACHRYMAL APPARATUS.

630. JACKSON, E. **Traumatic dislocation of the lachrymal gland with a foreign body in the orbit.** *Ophth. Record*, Aug., 1904.

631. SHOEMAKER, W. T. **A case of bilateral enlargement of the lachrymal glands.** *Annals of Ophth.*, July, 1904.

632. SNELL, A. C. **Acute dacryoadenitis.** *Ophthalmology*, Oct., 1904.

633. PES, O. **Acute bilateral lachrymal adenitis in urethritis.** *Arch. f. Augenheilk.*, li., 2, p. 144.

634. FORTUNATI, A. **Tuberculosis of the lachrymal gland.** *Annali di Ottalm.*, 1904, 10 and 11.

635. ROLLET, E. **Gigantic ectasy of the lachrymal gland.** *Annales d'ocul.*, cxxxii., p. 279.

636. CIRINCIONE, F. **Extirpation of the lachrymal sac.** *Clinica oculistica*, Aug., 1904.

637. BASSO, D. **Extirpation of the lachrymal sac and canal.** *Ann. di Ottalm.*, 7-8, 1904.

638. v. HYMMEN, H. **Extirpation of the lachrymal sac.** *Würtemb. Corresp.-Blatt*, Nov., 1904.

639. PETERS. **Results of nasal examination in twenty-four cases of lachrymal fistula.** *Münch. med. Wochenschr.*, 1905, No. 3, p. 147.

JACKSON (630, **dislocation of lachrymal gland**) reports the case of a man who fell on his head from a wagon, cutting open the lid over the upper orbital margin. The wound was sutured and healed by first intention, but swelling and redness persisted. The globe was displaced 13*mm* forward, 4*mm* downward, and 3*mm* inward. A hard mass in the outer part of the upper lid proved to be the dislocated tear gland. This was excised, but

the wound was opened subsequently, and pieces of wood were removed, at intervals, from the orbit. Thirteen cases of traumatic luxation of the tear gland were found. ALLING.

SHOEMAKER (631, **bilateral enlargement of lachrymal glands**) reports a case of symmetrical enlargement of the tear gland of four years' standing. Constitutional disturbances; in this case severe anæmia and possibly syphilis are ætiologic factors. The article contains a review of our present knowledge of diseases of the lachrymal gland. ALLING.

SNELL (632, **acute dacryoadenitis**), in an extensive search through literature, has found only 134 recorded cases of acute dacryoadenitis. He gives the clinical histories of two cases of abscess of the lachrymal gland, one of which was probably caused by the micro-organism of influenza. ALLING.

PES (633, **bilateral lachrymal-adenitis in urethritis**) saw four cases of gonorrhœa, complicated by sudden development of bilateral total dacryoadenitis. Suppuration did not ensue, nor were gonococci found in the tears or conjunctival secretion. The inflammation was probably due to toxines, and yielded promptly to simple local applications.

FORTUNATI (634, **tuberculosis of lachr. gland**) operated on a woman of sixty-two, removing a tumor of the tear gland which showed a tuberculous structure. No bacilli could be found, and animal experiments proved negative. CIRINCIONE.

ROLLET (635, **gigantic ectasy of lachrymal gland**) observed, in a man of sixty-seven an ectasia of the tear sac which had developed in two years and was the size of a walnut. After aspiration the sac was injected with paraffin and extirpated. Healing took place promptly and the epiphora disappeared.

BERGER.

CIRINCIONE (636, **extirpation of lach. sac**) lays stress on the complete removal of the tear canal down to the nasal mucosa. This is followed by primary union and excludes relapses. After isolation of the sac, an incision is made in the aponeurosis which fastens the lower end of the sac to the wall of the bony canal. A part of the contents of the nasal canal is then separated with a special bayonet-shaped double-edged bistoury. The complete extirpation of the canal requires the use of the cautery, which is also employed to obliterate the puncta. Extirpation is indicated

when the enlargement of the sac is marked, or associated with chronic nasal disease. CIRINCIONE.

BASSO (637, **extirpation of lachyrmal sac and canal**) concludes from an anatomical study of several cases that the presence of an enlargement of the tear sac implies a partial or extensive organic stenosis of the canal with concentric contracture. The nasal canal must be removed if the operation is to be radical. CIRINCIONE.

HYMMEN (638, **extirp. lachr. sac**) reports 85 % of cures in 171 lachrymal-sac extirpations at the Tübingen clinic; 15 % healed badly or had persistent epiphora or purulent secretion from the puncta. Patients under twenty-five give the poorest results. Most sac affections are found among the unskilled laborers. The radical operation is warmly recommended.

PETERS (639, **results of 24 nasal examinations of nose in lachr. fistula**) found accessory-sinus disease in just half of his cases of phlegmon or fistula in the region of the tear sac. In uncomplicated sac suppurations this element is lacking. The recognition of ethmoidal involvement requires repeated examination under cocainization.

X.—ORBIT AND ACCESSORY CAVITIES.

640. MORROW, E. P. **A case of foreign body within the orbit with penetration of the cranial cavity.** *Oph. Record*, Oct., 1904.

641. WÜRDEMANN, H. V. **Tumors of the eye and orbit.** *Jour. Amer. Med. Asso.*, Dec. 17, 1904.

642. MACCALLUM, W. G., and CORNELL, W. B. **On the mechanism of exophthalmos.** *Med. News*, Oct. 15, 1904.

643. USHER, C. H. **Notes on cases of pulsating exophthalmos.** *Ophthalmic Review*, Nov., 1904.

644. VOSSIUS. **Krönlein's temporary resection of the orbital wall.** Sitzungsber. d. medic. Gesellsch., Giessen, June 21, 1904. *Deutsche med. Wochensch.*, No. 49, 1904.

645. MAZZA, A. **Large ivory exostosis of the orbit.** *Ann. d'oculist.*, cxxxii., p. 419.

646. NICOLINI, T. **A case of dense orbital osteoma.** *Clinica oculistica*, July, 1904.

647. SWASEY, E. **Left exophthalmos of obscure origin.** *Ophth. Record*, June, 1904.

648. HOTZ, BENNO. **Exophthalmos and chorea cured by removal of adenoids.** *Berl. klin. Wochenschr.*, 1904, p. 91.

649. SCHLÜPMANN, E. **Two cases of pulsating exophthalmos cured by ligation of the common carotid.** *Inaug. Dissert.*, Tübingen, 1904.

650. BERNARD, H. L., and RIGBY, H. M. **Pulsating exophthalmos due to aneurysm of the internal carotid.** *Annals of Surgery*, May, 1904.

651. PICK, L. **A case of intermittent exophthalmos.** *Deutsche med. Wochenschr.*, 1904, No. 37, p. 1363.

652. GRUNERT, KARL. **Experiences in the surgery of the upper accessory cavities with special regard to post-operative oculo-muscular disturbances.** *Zeitschr. f. Augenheilk.*, xii., 6, p. 762.

In MORROW'S (640, **foreign body penetrated through orbit into cranium**) case an explosion resulted in lodgment of the breech of a gun in the inner and upper walls of the orbit, leaving a large area of brain exposed. The eye was enucleated, and although orbital cellulitis ensued it subsided under irrigation and drainage and the patient made a good recovery. ALLING.

WÜRDEMANN'S (641, **tumors of eye and orbit**) contribution consists of a classification of tumors of the eye and orbit as a preliminary to a more extensive discussion of the whole subject. ALLING.

MACCALLUM and CORNELL (642, **mechanism of exophthalmos**) in experimenting upon animals concerning exophthalmos made use of an apparatus consisting of a lever working on a pivot and recording changes in the position of the eyeball upon a revolving drum. They found that ligature of the internal jugular vein produced very little effect, while closure of the external jugular on the side observed was followed by marked exophthalmos, accompanied by œdema of the face and orbit. These later disappeared by the establishment of collateral circulation. Stimulation of the cervical sympathetic produced exophthalmos, and since this was also observed after the head of the dog had been severed from the body, the exophthalmos was likely to be independent of vascular changes. It seemed to be due to the contraction of the so-called muscular orbitalis of Müller, which is well developed in the dog, yet not entirely wanting in man. In two cases where opportunity was offered for stimulation of the cervical sympathetic in man there was no exophthalmos, but dilatation of the pupil. Hence the question of the cause of exophthalmos in Graves's disease is not solved. ALLING.

In C. H. USHER'S (643, **cases of exophthalmos**) paper details are given of three cases of pulsating exophthalmos. No. 1 was a fatal case of traumatic origin. The patient was a fisherman who was shot in the head and face with a fowling-piece at a distance of twelve yards. When seen there was no P. L. in the right eye, and pulsation was felt through the lid. There was much proptosis, and the lids were greatly swollen and ecchy-

mosed. The globe scarcely moved in any direction, and the pupil was semi-dilated and inactive. There was a small wound at the upper and inner part of the upper lid. There were also other wounds about the head and face. Three days after the injury, the right external and internal carotids were ligatured just above the bifurcation ; the pulsation was then no longer felt. On the eighth day after the accident he had a sudden attack of dyspnœa, became comatose, and died. A careful dissection of the orbit was made, and a communication was found between some branches of the ophthalmic artery and the cavernous sinus. No foreign body was found within the orbit even with the X-rays, so that the somewhat unsatisfactory view had to be taken that the injury was caused by contrecoup. What part, if any, the ligaturing of the artery played in the development of the symptoms it was impossible to determine. The patient was an alcoholic subject. Case 2 was a shepherd, aged fifty-seven, who, on waking one morning, found a "stiffness" in the left eye, and noticed that it was redder than normal ; the sight was, however, as good as ever, and there had been no injury. The patient complained of noises in the head. He was a temperate man and had never suffered from gout, syphilis, or rheumatism ; he also had a good family history. The external and internal carotid arteries were ligatured close above the bifurcation. The bruit became much less and no pulsation could be felt. He attended seven years later with epithelioma of the lip, when it was found there was no bruit or pulsation, and he had been working as a shepherd ever since in a hilly district. His arteries, which were, when first seen, rather rigid, were now much more so. The cause of this case was probably an aneurysm of the internal carotid or ophthalmic artery. Case 3 was that of a girl aged four years, whose parents had noticed that for two months the left eye had been getting prominent. Two weeks previous to this the child had fallen down-stairs and had injured the left side of the face. She was unconscious for ten or fifteen minutes, and there was much bruising of the eyelids. When seen there was much proptosis with pulsation, which latter could be arrested by pressure on the carotid artery. The movements of the eyeball were unimpaired, and there was vision in the eye. The left common carotid artery was ligatured. The proptosis diminished but soon returned, while the bruit was always pres-

ent. Sixteen months later the symptoms were as bad as ever, the pupil was inactive, though objects could still be seen with the eye. The advantages claimed for ligaturing the internal and external carotids over ligaturing the common carotid, are that the collateral circulation from the branches of the opposite external is more effectually prevented, as also is that between the branches of the ophthalmic artery and those of the external carotid branches. MARSHALL.

VOSSIUS (644, **Krönlein's operation**) reports the case of a woman with unilateral optic-nerve atrophy, in whom three years later there developed gradually increasing exophthalmos, ptosis, and œdema of the upper lid. Krönlein's operation failed to reveal an orbital tumor. This procedure need not be feared, even for exploratory purposes, as the cosmetic effect is good.

MAZZA (645, **large ivory exostosis**) saw a peasant girl of seventeen with $V = \frac{3}{4}$ and a dislocation of the globe toward the temporal side. An almost cubical osteoma, evidently arising from the ethmoid cells, was seized with volsellum forceps and removed after several attempts. The eye returned to its normal position, and motility was gradually restored. BERGER.

NICOLINI (646, **dense orbital osteoma**) treated a case of osteoma of the median wall of the orbit ; the neighboring tissues of the upper lid showed lardaceous thickening and were extirpated. The bony tumor then disappeared. CIRINCIONE.

SWASEY (647, **obscure large exophthalmos**) was consulted by a woman of twenty-four, of healthy appearance. Two months previously she had had an attack of paralysis of the left external rectus. Two months later exophthalmos developed, increasing steadily for one week without pain, congestion, or œdema about the eye. No orbital tumor could be felt. There was marked optic neuritis with bright spots at the macula suggesting albuminuric retinitis. The eye was totally blind. Kidneys, heart, and thyroid were normal. Inunctions, iodides, and faradism were used. After three months the nerve was atrophic, but the exophthalmos and the paralysis of the external rectus had disappeared. The ætiology of the case is obscure. Syphilis was probably not a factor. ALLING.

HOTZ (648, **exophthalmos and chorea cured by adenotomy**) observed two boys in whom idiopathic double exophthalmos, undoubtedly due to a forme fruste of Graves's disease, disappeared

after removal of adenoid vegetations. In one case cure resulted after relapse and a second operation, double tonsillectomy having had no effect. Hotz concludes that abnormal secretions from lymphoid hypertrophy in the naso-pharynx may cause an intoxication of the central nervous system and induce Graves's disease. Of the three symptoms, goitre, tachycardia, and exophthalmos, the last is the most characteristic.

SCHLÜPMANN, E. (649, **two cases of exophthalmos cured by ligation of common carotid**).

BERNARD and RIGBY (650, **two cases of exophthalmos cured by ligation of internal carotid**) describe a case of gunshot wound of the base of the skull in which pulsating exophthalmos developed, and disappeared after ligation of the common carotid. The patient died, about two and a half months after the injury, of brain abscess. Autopsy showed two sacculated aneurysms of the cranial portion of the carotid, one at the petrosal curvature, the other near the posterior portion of the cavernous sinus. The latter was not connected with the carotid, showing that pulsating exophthalmos may develop without a direct arterio-venous connection. ALLING.

PICK'S (651, **intermittent exophthalmos**) case is undoubtedly one of varix of a branch of the ophthalmic vein probably due to syphilitic endophlebitis.

GRUNNERT (652, **surgery of accessory cavities**) has developed, in the Halle ear clinic, a frontal sinus operation which has given him excellent results. Adopting Kuhnt's suggestion to obliterate the cavity, he then opens up the labyrinth of the ethmoid, with a modification of Kilian's method.

XI.—CONJUNCTIVA.

653. STANDISH, MILES. **The treatment of purulent conjunctivitis.** *Jour. Amer. Med. Asso.*, Dec. 17, 1904.

654. STIRLING, J. W. and MCCRAE, JOHN. **A case of Parinaud's conjunctivitis with pathological report.** *Ophthalmic Review*, Oct., 1904.

655. GERLOFF. **Note on the use of quinine in external inflammations of the eye.** *Klin. Monatsbl f. Augenheilk.*, xlii., 2, p. 483.

656. VOSSIUS. **A case of purulent conjunctivitis and irido-cyclitis of both eyes after dysentery.** *Ophthalm. Klinik*, 1904, No. 2.

657. MATYS, W. **A case of Parinaud's conjunctivitis.** *Zeitschr. f. Augenheilk.*, xii., 4, p. 557.

658. DE FALCO, ANDREA. **The pathogenesis of vascular, secretory,**

and nodular affections of the conjunctiva and neighboring mucous membranes. *Ann. di Ottalm.*, 10 and 11, 1904.

659. GORTAGOW. **Comparative treatment of trachoma with sublimate-glycerine, 1 % silver nitrate, and 1 % ichthargan.** *Allg. med. Central-Zeitg.*, 1904, No. 51.

660. BOCK, E. **The treatment of trachoma with cupro-citrol (Arlt).** *Aerztl. Central Zeitg.*, Vienna, 1904, No. 51.

661. HEISRATH, FR. **On the treatment of granular ophthalmia with special regard to operative procedures.** Posth. Ed. by Pollnow, 1904, Leipsic.

662. COHN, H. **The cure of trachoma by radium. Preliminary note.** *Berl. klin. Wochenschr.*, 1905, No. 1.

663. CONTINO, A. **Tuberculous ulcer of the tarsal conjunctiva.** *Clin. oculist.*, Nov.-Dec., 1904.

664. CAPOLONGO, CARLO. **Contribution to the clinical and anatomic study of serous cysts of the fornix fold.** *Ann. di Ottalm.*, No. 5, 1904.

665. TERSON, A. **Extensive lymphangiectasy of the bulbar conjunctiva.** *Soc. d'ophtalm. de Paris*, Nov. 8, 1904.

666. HESS. **On ophthalmia neonatorum.** *Med. Klinik*, 1904, No. 3.

The position taken by STANDISH (653, **treatment of pur. conjunctivitis**), which he supports by statistics taken from the records of the department of the Mass. Charitable Eye and Ear Infirmary devoted to contagious diseases, cannot be better stated than by quoting his conclusions: The newer silver salts are more easily applied, safer in use, and produce better results than nitrate of silver. In cases of ophthalmia neonatorum, either protargol or argyrol is an entirely satisfactory agent. In cases of gonorrhœal ophthalmia, in the adult the results obtained, if treatment is begun early, are approximately the same with either preparation, but when the cornea is affected protargol appears to be better. His final, somewhat radical, statement is to the effect that the application of cold during the stage of swelling is a dangerous procedure and should be abandoned. ALLING.

The disease reported by STIRLING and MCCREA (654, **Parinaud's conjunct. with pathologic report**), lymphoma of the conjunctiva as the Germans call it, is one of which hardly any mention is made in text-books. It is characterized by large follicular masses on the palpebral conjunctiva, with enlargement and even suppuration of the neighboring lymphatic glands. There is a rise of temperature each evening even up to 103°, and as a rule one eye only is affected. It runs a slow course and tends toward recovery. The patient was first seen in Nov., 1903, and the right eye had then been inflamed for 10 days. There were

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marked swelling and irritation of both lids, which were granular on their inner surfaces. Trachoma was diagnosed provisionally and nitrate of silver, 2 %, was used. In 48 hours the condition had spread and organisms very like the Klebs-Loeffler were found. A mouse inoculated died in two days. In the eye a false membrane developed and the pharynx became ulcerated, but a bacteriological examination of the throat proved negative. The temperature was high and the glands were enlarged. Parinaud's conjunctivitis was then diagnosed. Antidiphtheritic serum of Roux was used, but did no good. The swollen glands which were breaking down were then excised, and a rapid amelioration of the disease at once set in, so that in two months the condition was cured. A detailed account of the bacteriological condition is given, and the conclusion is arrived at that the condition was due either to a virulent form of the bacillus xerosis or to a less toxic form of the bacillus diphtheriæ.

MARSHALL.

GERLOFF (655, **quinine in external inflammations**) has had good results in trachoma, hypertrophic catarrh, and similar severe catarrhs of the eye from the internal administration of quinine, 8 grains pro die for an extended period.

VOSSIUS (656, **purulent conjunctivitis and iridio-cyclitis in dysentery**) reports the development, in the third week of dysentery, of urethritis and conjunctivitis with scanty muco-purulent discharge in which a micro-organism was found very similar to the bacterium coli commune. The lids became greatly swollen; keratitis, iritis, and vitreous turbidity developed, all of which yielded to calomel and aspirin-diaphoresis.

MATYS (657, **case of Parinaud's conjts.**) describes a severe attack of Parinaud's disease which is characterized by its localization on the conjunctiva, early swelling of the parotid and submaxillary glands, and slight fever. The glands occasionally suppurate. The chemotic conjunctiva shows numerous yellowish-gray nodules and secretes freely. This invariably heals—in Maty's case after ten months. The cornea is not affected. Generally, one eye only is involved. Tuberculosis and glanders are the only other affections which would be thought of in a differential diagnosis. The cause of the simultaneous affection of conjunctiva and lymph glands is unknown.

DE FALCO (658, **pathogenesis of nodular affections of**

conj.) believes the etiology of trachoma to be anatomical, based on the adenoid structure of the conjunctiva. The vasomotor and secretory centre of the eye is the ciliary plexus, which is affected by the products of exertion of the ciliary muscle. All nodular affections of the ocular and nasal mucosæ are anatomic consequences of eye-strain. Treatment must aim to improve the general condition, counteract the morbid irritability of the ciliary plexus, and bring about resorption of the nodules.

CIRINCIONE.

GORTAGOW (659, **comparative treatment of trachoma**) concludes from his observations that ichthargon gives a higher percentage of cures than bichloride or silver and is less apt to irritate or cause argyrosis. Pannus, too, yields to applications of a 1 % solution. HIRSCHMANN.

BOCK (660, **treatment of trachoma with cupro-citrol**) recommends copper citrate as the best application in advanced trachoma with cicatricial changes, and particularly for pannus. The fact that the patient can apply the remedy himself, twice daily, in the form of a 5 % or 10 % salve and go about his business is a decided advantage.

HEISRATH'S (661, **treatmentof trachoma with radium and other remedies**) contribution is an almost complete presentation of his experience with the operation, which he first carried out in a routine manner, of removal of the tarsus and diseased conjunctiva in old trachoma with pannus. Pollnow upholds Heisrath's priority in this procedure as against Kuhnt, who advised the extirpation of the tarsus alone.

COHN (662, **cure of trachoma by radium**) was able to bring about the rapid disappearance of trachoma follicles, which had been treated in vain for months, by exposing them to the emanations from one milligram of radium enclosed in glass. The procedure is not only painless but absolutely harmless, as only a small quantity was used, and the radiation was allowed to act only ten to fifteen minutes.

CONTINO (663, **tuberculous ulcer of the tarsal conjunctiva**) reports a case of tuberculous ulcer of the palpebral conjunctiva in which animal experimentation (on rabbits) and bacteriologic examination were positive. Local and constitutional treatment with Maragliano's serums (serum anticorpum and serum antitoxi-

cum) was followed by cicatrization of the ulcer. The patient, a girl of ten, died two months later of meningitis.

CIRINCIONE.

CAPOLONGO (664, **serous cyst in the fornix fold**) reports on the histologic examination of three cases of cysts of Henle's glands, showing, in all, hyaline degeneration of the epithelial layer lining the inner wall. Cystic dilatation of a duct of a Krauserian gland is also described. CIRINCIONE.

TERSON (665, **lymphangiectasia of bulbar conjunctiva**) presented a patient with marked ectasia of the lymph-vessels in the bulbar conjunctiva. There was no conjunctivitis, or swelling of the lymph-glands. The enlarged lymphatics, which look like white threads, form several distinct groups: one, horizontal, on the temporal side; others above and below the cornea, and two on the nasal side, above and below, respectively; the last terminating in a plexus bordering on the semilunar fold.

BERGER.

HESS (666, **ophthalmia neonatorum**) is convinced that Credé's instillations never do harm. Their use by midwives should be obligatory rather than elective. Succedanea for nitrate of silver, particularly protargol, are condemned. As gonococci are found many days after suppuration has ceased, it is advisable to continue the 1 % solution of silver for some time.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

667. WEEKS, J. E. **Deposit of silver in the epithelial layer of the cornea.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

668. LEOPOLD, G. **Herpes zoster ophthalmicus.** *Inaug. Diss.*, Tübingen, 1904.

669. ELIASBERG. **Treatment of scrofulous eyes.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 456.

670. EWING, A. E. **Bullous keratitis: fatty degeneration of Bowman's membrane.** *Am. Journ. of Ophthalm.*, June, 1904.

671. VILLARD, H. **Corneal affections in acquired syphilis.** *Annales d'oculist.*, cxxxii., p. 253.

672. STANCULEANO, G. **Studies in the diagnosis and treatment of parenchymatous keratitis with tuberculin T.** *Ann. d'ocul.*, cxxxii., p. 340.

673. TRANTAS. **Malignant parenchymatous keratitis and pregnancy, induced labor, recovery.** *Arch. d'opht.*, xxiv., No. 12, p. 783.

674. MARTIN, A. **On the occurrence of a bacterial sward on the eye.** *Arch. f. Augenheilk.*, li., 2, p. 141.

675. Morax, V. **Annular abscess of the cornea and its significance.** *Ann. d'ocul.*, cxxxii., p. 409. Illustrated.

676. Zur Nedden. **Infectious marginal ulcer of the cornea.** *v. Graefe's Arch. f. Ophth.*, lix., 2, p. 360.

677. Colombo, G., and Ricchi, G. **Contribution to the pathologic anatomy of hypopyon keratitis.** *Annali di Ottalm.*, No. 12, 1904.

678. Nerli, G. **Contribution to the treatment of infiltrating keratitis and corneal abscess.** *Clin. oculist.*, Nov.-Dec., 1904.

679. Zeller, O. **The treatment of serpent ulcer with pneumococcus serum.** (Römer) *Württemb. medic. Corresp.-Bl.*, No. 1, 1904.

680. Schulte. **The treatment of ulcus serpens.** *Ophtalm. Klinik*, No. 1, 1904.

681. Zur Nedden. **Clinical experience in the treatment of ulcus serpens with Römer's pneumococcic serum.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 552.

682. Young, H. B. **Microcornea without microphthalmus.** *Annals of Ophthal.*, Oct., 1904.

683. Veasey, C. A. **Report of a case of spring catarrh simulating malignant new-growth of the corneal limbus.** *Amer. Jour. Med. Sci.*, May, 1904.

684. Del Monte, A. **Melanotic sarcoma of the limbus infiltrating the cornea.** *Annali di Ottalm.*, No. 10-11, 1904.

685. Bell, G. H. **Melanosarcoma of the limbus in an eye with normal vision, followed by enucleation.** *Arch. f. Ophth.*, xxxiii., 6, p. 579.

686. Fraenkel. **A case of professional scleral rupture.** *Pract. Wratsch*, 1904.

Weeks (667, **deposit of silver in epithelium of cornea**) saw two cases in which, after silver nitrate had been used for an ulcer of the cornea, a black deposit was found in the corneal tissue. It was probably thrown out of solution as a chloride, and afterwards reduced to metallic silver. Alling.

Leopold (668, **herpes zoster ophthalmicus**) describes in detail a case of herpes zoster in the region of the ophthalmic branch of the trigeminal. The ocular symptoms were anæsthesia and eruption of vesicles on the cornea, iritis with deposits on Descemet's membrane, progressive nuclear opacity in the lens, and transitory ptosis.

Eliasberg (669, **treatment of scrofulous eyes**) treats severe scrofulous inflammation of the cornea with a salve composed of mercuric oxide 1 %, cocaine, atropine, and silver nitrate, ½ %. It is put up in a black salve pot.

Ewing (670, **bullous keratitis, fatty degeneration of Bowman's membrane**) reports in detail on the histological examination of a glaucomatous eye in which a bullous keratitis had

developed. The formation of vesicles occurs in four stages: first, fatty degeneration of Bowman's membrane with thickening of the epithelial layer; second, further degeneration of the anterior limiting membrane with involvement of the corneal stroma,—the basal cells of the epithelium are absorbed; third, formation of a cyst-wall and proliferation of epithelial cells; finally, fibrin leucocytes and spindle cells appear in the vesicle, and, later, blood-vessels develop. ALLING.

VILLARD (671, **corneal affections in syphilis**) draws attention to a circumscribed form of parenchymatous keratitis which is less well known than the more common diffuse variety. It is almost always accompanied by iritis, which may run a malignant course or be complicated with choroiditis. In Villard's cases, intramuscular injections of biniodide of mercury brought about a complete cure. BERGER.

STANCULEANO (672, **parenchymatous keratitis treated with tuberculin**) examined a specimen of keratitis parenchymatosa from a young girl who had had this affection for a year and had died of pulmonary tuberculosis. An "internal" ulcer was found in the form of destruction of the deeper layers of the cornea, and of the iris where it adhered to these points. The anterior layers of the cornea and Bowman's membrane were not affected.

STANCULEANO (672) used tuberculin T dissolved in 2 % carbolic acid to determine whether parenchymatous keratitis has a tubercular basis. Of eight patients with this form of keratitis, five showed a rise of temperature, with increase of local inflammation and of the corneal opacity. In two cases, prolonged use of tuberculin was followed by a clearing of the corneal opacity. BERGER.

TRANTAS (673, **malignant parenchymatous keratitis and pregnancy**) observed a severe case of parenchymatous keratitis in a woman of twenty-seven with hereditary syphilis, in the eighth month of pregnancy. In spite of energetic treatment with mercury, phthisis bulbi ensued. In a later pregnancy, the other eye became affected in exactly the same way and became rapidly worse in spite of treatment as before. The inference that the pregnancy alone was the cause of this ominous course was borne out by the result of induced labor. A marked improvement immediately followed, and gradually the eye got well.
V. MITTELSTÄDT.

MARTIN (674, **bacterial sward on eye**) saw a patient who had a bit of chaff lying with its concave surface on the cornea. The convexity was covered with a rich sward of coryne bacteria which did not grow when removed from this nidus.

MORAX (675, **annular abscess of cornea**) saw a woman of forty-seven with double metastatic ophthalmia due to pneumococci. The primary affection seems to have been in the lung. The patient had general sepsis and ulcerative endocarditis. Ring abscess of the cornea developed in one eye, necessitating enucleation ; death three days later. The specimen showed purulent irido-choroiditis and a massive invasion of pus cells at the limbus. The cornea contained no pneumococci, which were present in large numbers in the anterior chamber. Morax agrees with Fuchs that the ring abscess of the cornea is caused by the toxines of the cocci in the anterior chamber. BERGER.

ZUR NEDDEN (676, **infectious marginal ulcer**) has studied sixty-five more cases of marginal ulcer due to the bacillus found by him three years ago, and finds his original theories confirmed. The disease develops spontaneously in the aged. The specific micro-organism develops in the conjunctival sac, which it does not affect.

COLOMBO and RICCHI (677, **pathology of hypopyon keratitis**) examined a corneal ulcer with hypopyon in an eye blind from absolute glaucoma. The pneumococcus was found, but only on the margin and in the superficial layers of the base of the ulcer. The destruction of Descemet's membrane, the hypopyon, and the iritis were due to the toxines of the pneumococci. CIRINCIONE.

NERLI (678, **treatment of infiltration and abscess of cornea**) prefers to use eserine in hypopyon keratitis, unless iritis is present. In that case he uses eserine and atropine alternately. Iodoform is preferred to silver. CIRINCIONE.

ZELLER (679, **treatment of serpent ulcer by pneumococcic serum**) used Römer's pneumococcic serum in fourteen cases of ulcus serpens, but had good results in only two, both young patients. In other cases requiring the use of the cautery, the serum appeared to have beneficial effect at times ; in some it was quite useless.

SCHULTE (680, **treatment of ulcus serpens**) makes a minute

perforation at the base of serpent ulcers with the galvano-cautery, and each day uses a spud to remove the yellowish-white mass which plugs the opening. This is continued until the ulcer is clean. The principle is the same as that of the Saemisch incision, *i. e.* to improve the nutrition of the cornea by suspending the anterior chamber, and has the advantage of avoiding anterior synechiæ.

ZUR NEDDEN (681, **treatment of ulcus serpens with Römer's pneumococcic serum**) treated 14 cases of serpent ulcer with hypodermic injections of Römer's serum, and was successful in two. In these, the ulcers were about 1*mm* in diameter. Their nature was only recognized by cultures. Larger ulcers, particularly those of adults, were not improved by the serum, even when large doses were injected. The presence of pneumococci in the ulcers could be demonstrated by cultures at all times.

YOUNG (682, **Microcornea without microphthalmus**). *Ann. of Ophthal.*, Oct., 1904.

VEASEY (683, **spring catarrh simulating tumor**) describes a tumor which clinically and histologically resembled a sarcoma, but which proved to be a hypertrophic catarrh of the limbus, which had been present in one eye for nearly three years before the other became affected. ALLING.

Sections XIII.–XVIII. Reviewed by DR. O. BRECHT, Stettin.

XIII.—LENS.

687. VOSSIUS, A. (Giessen). **Goitre and cataract.** *Zeitschr. f klin. Med.*, vol. lv.

688. CALHOUN, A. W. **Is bilateral cataract extraction justifiable?** *Jour. Am. Med. Assn.*, Dec. 24, 1904.

689. WRIGHT, R. H. **Report of cataract extractions.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

690. KOSLOWSKI (Kiew). **On the treatment of posterior capsular cataract.** *Arch. f Augenheilk.*, li., p. 105.

691. BONAMICO, M. **Observations on the extraction in the capsule.** *Clinica oculist.*, Nov.-Dec., 1904.

692. VALUDE. **Expulsive hemorrhage following extraction.** *Soc. d' opht.*, 1904, p. 759.

693. DEMARIA, E. B. **Experimental research on the production of cataract by massage of the lens.** *Arch. f. Ophth.*, lix., p. 568.

694. SAEFFNER, O. **On the pathogenesis of napthalin cataract.** *Arch. f. Ophth.*, lix., p. 520.

695. DE LAPERSONNE and POULARD. **On preliminary capsular**

discission. *Soc. d'opht. de Paris*, Nov. 8, 1904.

695A. BOCCHI, A. **The elimination of bandaging after cataract operation.** *Ann. di Ottalm.*, No. 10-11, 1904.

695B. PAON. **Mechanism of rupture and subconjunctival dislocation of the lens (pathological anatomy and pathogenesis).** *Ann. d' oculist.*, cxxxii., p. 330.

695C. BELLINZONA, C. **Subconjunctival dislocation of the lens.** *Gazz. med. lombard.*, No. 44, 1904.

695D. THOMSON. **Observations on the pathology of the crystalline lens.** *Ann. of Ophth.*, 1904, p. 539.

VOSSIUS (687, **goitre and cataract**) has observed 28 cases of cataract complicating goitre. In the great majority of these, particularly the pre-senile, the opacity is nuclear. The lens changes are probably secondary to ocular disease from disturbance of nutrition dependent on constitutional disorders.

CALHOUN (688, **bilateral extraction not justifiable**) expresses his firm conviction that double cataract extraction is unjustifiable. ALLING.

WRIGHT (689, **statistics of cataract at N. Y. Eye and Ear Infirmary**) gives data of 247 cataract-extractions: 120 were simple, with iridectomy, 6 linear, 1 capsular, 2 in excessive myopia, 1 congenital. There were 8 cases of iris prolapse, 2 of intraocular hemorrhage, 7 of panophthalmitis, and 100 of iridocyclitis. ALLING.

KOSLOWSKI (690, **extraction of unripe cataract**) extracts the clear lens in the capsule in cases of posterior capsular cataract; 21 cases from ten to forty years of age. Resulting vision satisfactory. A secondary discission is generally required.

BONAMICO (691, **extraction with capsule**) shows that the maturity of the cataract may be left out of consideration in extraction in the capsule. The section must be large and entirely corneal. Escape of aqueous is apt to occur if the lens is turned round. This should be avoided if possible. CIRINCIONE.

VALUDE (692, **expulsive hemorrhage**) reports the case of a man of fifty-four. Four days after a normal cataract extraction the iris prolapsed and was immediately abscised. On the following day expulsive bleeding took place, and sight was lost. The lateness of this hemorrhage is remarkable and may have been connected in some way with the prolapse of the iris.

BERGER.

DEMARIA (693, **artificial ripening of cataract**) shows that massage of the lens produces primarily a mechanical tearing, detachment, and wrinkling of the epithelial layer on the anterior capsule. This opens the way for imbibition with aqueous, with a second stage of degeneration in the epithelium and cloudy swelling of the lens fibres. The latter may be broken up if the massage be very vigorous. The capsule itself always remains intact.

SAEFFNER (694, **pathogenesis of naphthalin cataract**) concludes that it is not the naphthalin itself, but a product of its decomposition, circulating in the blood, which damages the eye. This body has not been isolated. The capsular epithelium of the lens shows changes long before the ciliary body appears to be affected. The first changes consist in swelling of the fibres. Naphthalin cataract is very much like that observed in glass-blowers, after lightning stroke, and after massage, in all of which, by thermic, mechanical, chemical, or electrolytic action, the lens capsule is injured and imbibition of the lens fibres with opacification results.

DE LAPERSONNE and POULARD (695, **preliminary capsular discission**) recommend early discission of secondary cataract. In thirteen combined extractions, the secondary operation was performed on the sixteenth or seventeenth day. The elasticity of the after-cataract, which soon disappears, allows a wide retraction of the split membrane if the operation be performed early. The time is determined by the more or less rapid healing of the extraction wound, and by the amount of irritation present. The pupil is dilated and a sickle-shaped needle, with flexible shaft, introduced through the sclera, above the site of section, and carried behind the secondary cataract, through which it cuts on being withdrawn.* After simple extraction the same procedure would be indicated, and transfixing of the peripheral portion of the iris would be of no moment if the pupil were fully dilated.

v. MITTLESTÄDT.

VALUDE (695, **answers the preceding authors**) answers the preceding authors by calling attention to the fact that in Hasner's discission of the capsule only a small quantity of

* De Lapersonne has abandoned the introduction and cutting from behind. H. K.

vitreous gets into the anterior chamber, so that there can be no question of a loss of vitreous. This procedure is indicated in traumatic cataract, after removal of the artificially opacified lens in high myopia, and in those cases in which, after cleaning the pupillary area, a grayish opacity remains. The results are uniformly good. BERGER.

BOCCHI (695A, **elimination of bandaging**) expresses the opinion that the open treatment of cataract extraction is rational and progressive, marking a distinct advance. Fuchs's method is the best, as the operated eye is protected against injury, the first and most important consideration. CIRINCIONE.

PAON (695B, **subconjunctival dislocation of the lens**) examined a globe which had been struck near the inner canthus. There was a rupture of the sclera on the temporal side, *6mm* long, running $1\frac{1}{2}$*mm* from the limbus. The lens was dislocated, partly into the anterior chamber, and partly under the conjunctiva. BERGER.

BELLINZONO (695C, **dislocation**) describes a case of subconjunctival dislocation of the lens, following indirect injury in the neighborhood of the brow. The sclera was ruptured at the insertion of the external rectus. Fifty-four days after the injury the nucleus was still fairly well preserved ; the peripheral layers were reduced to amorphous detritus ; the hyaloid membrane was absent.

XIV.—IRIS.

696. LEHMANN, J. **Gonorrhœal metastatic iritis.** *Inaug. Diss.*, Berlin, 1904.

697. UHTHOFF. **Metastatic carcinoma of the ciliary body.** *Deutsche med. Wochenschr.*, 1904, p. 1423.

698. SCHIECK, F. **Pigmented cysts on the posterior surface of the iris.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 341.

699. RABITSCH, F. **On interepithelial uveal cysts.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 321.

700. PRAUN, E. **Detachment of the pigment layer of the iris and prolapse of the flap through the pupil.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 296.

701. FEJÉR, T. **On resorption of torn-off iris tissue in the globe.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 289.

702. FRENKEL. **Balance mydriasis or oscillating pupillary inequality.** *Arch. méd. de Toulouse*, Oct. 15 and Nov. 1, 1904.

703. SATTLER, H. **The re-introduction of iridodesis.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 469.

704. COSMETTATOS, G. F. **Atypical, partial bilateral coloboma of the iris.** *Arch. d'opht.*, xxiv., No. 11, p. 720.

705. MAGNANI, C. **Clinical contribution to the study of the innervation of the iris.** ARCH. OF OPHTH., xxxiii., 6, p. 591.

LEHMANN (696, **metastatic gonorrhœal iritis**) reports ten cases of metastatic iritis of gonorrhœal origin from Greeff's clinic, and describes the clinical picture in detail.

UHTHOFF (697, **metastatic carcinoma of ciliary body**) observed, in a man of forty-nine, an isolated apparently metastatic carcinoma of the ciliary body, in the lower quadrant of the left eye. The rest of the globe was sound. Severe inflammatory reaction and secondary glaucoma soon appeared. The primary tumor was not found, but the assumption of a carcinoma of the intestinal tract seemed justified by the symptoms. Post-mortem was refused. The non-effect of antisyphilitic treatment confirmed the diagnosis of carcinoma. Sarcoma could be excluded on the strength of the clinical picture.

SCHIECK (698, **pigmented cyst on posterior surface of the iris**) calls attention to the differential diagnosis between melanosarcoma and pigmented cyst of the iris, and its importance on account of the treatment to be carried out in either case. He reports one instance in which the clinical appearance led to the mistaken diagnosis of sarcoma, and adds a similar case which was observed by chance.

RABITSCH (699, **on interepithelial uveal cysts**) reports the chance finding of a cyst of the ciliary process in the myopic eye of a man of fifty-four.

PRAUN (700, **detachment of the pigment layer of the iris**) examined a woman of fifty with high myopia and contusion of the globe. The posterior layer of the iris had been partially peeled off and protruded into the anterior chamber.

FEJÉR (701, **resorption of torn-off iris-skirt**) observed the spontaneous resorption of a torn-off shred of iris tissue in an injured eye. The patient was a woman of thirty-seven.

FRENKEL (702, **balance mydriasis**) describes as mydriasis à bascule (balance), a form of oscillating dilatation which is invariably due to preceding spasm of the dilatator (sympathetic irritation). This symptom is not necessarily of unfavorable prognostic

significance, as claimed by Mendel and Hirschberg, for it occurs not only in incipient paresis, but in tabes, multiple sclerosis, neurasthenia, and internal diseases such as phthisis, as well.

BERGER.

SATTLER (703) advises iridodesis in appropriate cases of ectopia lentis, and reports a case operated on with good result.

COSMETTATOS (704, **typical bilateral coloboma**) observed, in a youth of eighteen with various cranial deformities, a coloboma downward and outward, from the base of which a groove ran curving outward and upward to the root of the iris. A similar defect was found in the other eye. In both, the coloboma was limited to the mesodermal layer, the layer of retinal pigment remaining intact. V. MITTELSTÄDT.

MAGNANI (705) reports mydriasis following contusion of the right eye in a young woman of twenty-five. Although there was neither direct nor consensual reaction to light, the pupil contracted promptly with convergence. Magnani is unable to offer any satisfactory theory in explanation of his observation.

ABELSDORFF.

XV.—CHOROID.

706. FUCHS, E. **Histologic changes in choroidal inflammation.** *Arch. f. Ophth.*, lviii., p. 391.

707. LEWIS, I. D. **Triple rupture of the choroid.** *Ophth. Record*, July, 1904.

708. ZASKIN. **A case of ossification of the choroid.** *Wojenno med. T.*, Oct., 1904.

709. PES, O. **Hyaloid bodies and papillary growths of the choroid.** *Arch. f. Ophth.*, lix., 3, p. 472.

710. RUMSCHEWITSCH, K. **Histology of so-called "Drusen" (nodules) of the lamina vitrea of the choroid.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 358.

711. FLEISCHER, B. **A contribution to the knowledge of choroidal new-growths.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 353.

712. BAQUIS, E. **Contribution to the knowledge of the structure and histogenesis of angiosarcoma of the choroid.** *Ann. di Ottalm.*, 7-8, 1904.

FUCHS (706, **pathology in choroiditis**) gives a systematic description of the anatomic changes found in choroidal inflammations and discusses more particularly the changes found after acute purulent processes in the pars ciliaris retinæ, retina, choroid, and subchoroidal layer. A detailed analysis of the various degrees of inflammatory thickening of this layer is added.

LEWIS (707, **triple choroidal rupture**) considers the following interesting features of his case: Two months after injury of the eye, three typical choroidal ruptures were seen: one in the nasal half of the fundus; a second, vertical, on the temporal side; and a third, horizontal, near the macula. There was no deposit of pigment along the margins. Near the macula there were a number of small whitish spots. ALLING.

ZASKIN (708, **ossification of choroid**) examined an eye which had been enucleated fifteen years after being struck with a whip. In the choroid three points of ossification were found, the largest being situated near the nerve-head. The bone consisted of concentric lamellæ with bone-corpuscles and Haversian canals containing cellular elements. This production of bone took place on inflammatory connective tissue.

HIRSCHMANN.

PES (709, **hyaloid bodies and papillary growths**) holds that hyaline warty growths (Drusen) of the lamina vitrea of the choroid may be the result of degenerative changes in the retinal pigment epithelium, or may develop in inflammatory processes, particularly those of the deeper layers of the choroid. The two forms are not to be confounded.

RUMSCHEWITSCH (710, **hyaloid nodules**) found warty growths (Drusen) of the hyaloid membrane of the choroid in four youthful eyes. These nodules always develop at the expense of the cells of the pigment epithelium, and contain lime deposits. Their formation does not depend on any activity of the lamina vitrea, and occurs as a senile change as well as in acute inflammatory processes. In the latter case the nodules are most numerous near the diseased area, in the vicinity of the nerve-head, and in the periphery. Changes in the chorio-capillaris probably cause these growths.

FLEISCHER (711, **choroidal new-growths**) found, in a man of sixty-five, a poorly pigmented and vascularized spindle-cell sarcoma, which, almost completely surrounding the nerve-head, had grown into the vitreous and split the retina into two layers. Proliferations of the tumor were found in the nerve, posterior ciliary vessels, pigment epithelium, and retina.

BAQUIS (712, **angiosarcoma of choroid**) concludes from a careful histologic study of a case of his own that non-pigmented

angiosarcomata may originate, not only in the chorio-capillaris, but in the pigmented layers of the choroid as well. A non-pigmented angiosarcoma may become a pigmented sarcoma in consequence of gradual pigmentation of originally colorless neoplastic elements; the formation of pigment within the sarcoma cell is a metabolic process of cell activity, although the basic material is supplied by the blood. CIRINCIONE.

XVI.—VITREOUS.

713. ELSCHNIG. **Detachment of the vitreous.** *Wien. med. Presse*, 1904, No. 50. *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 529.

714. FELIX, C. H. **Vascular loop in the vitreous.** *Geneesk. Tydschr. f. Nederl. Ind.*, xliv., part 9.

715. JOHNSTON, R. N. **Bacteriology of panophthalmitis.** *Med. News*, Aug. 20, 1904.

ELSCHNIG (713, **detachment of vitreous**) examined seventeen globes with myopia of from two to thirty dioptries, and five with atypic myopic refraction. In only four eyes was there an apparent detachment of the vitreous. On careful examination numerous fine strands of what looked like vitreous adhered to the retina. Microscopic study confirmed this, and showed that remnants of the limiting membrane were still attached to the retina. This finding corresponds completely with what Arlt described as fluidification of the vitreous. Elschnig's investigations disprove the assumption that detachment of the vitreous frequently complicates posterior staphyloma.

JOHNSTON (715, **bacteriology of panophthalmitis**) comes to the conclusion that the pneumococcus is the specific germ in the causation of panophthalmitis, although there are cases of mixed infection due to staphylococci and streptococci. ALLING.

XVII.—GLAUCOMA.

715A. WHITE, J. A. **Simple glaucoma or primary atrophy.** *Ophth. Record*, Oct., 1904.

716. DEMARET, J. **Osmotic pressure of intraocular fluids in glaucoma.** *Arch. d'opht.*, xxiv., No. 11, p. 709.

717. PETERS, A. **On glaucoma following contusion of the globe, and its treatment.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 545.

718. BELTMAN, J. **On congenital teleangiectasis of the eye as a cause of glaucoma simplex.** *Arch. f. Ophth.*, lix., p. 502.

719. ZAHN, E. **On the hereditary conditions in buphthalmus.** *Inaug. Diss.*, Tübingen, 1904.

720. CARBONE, A. **On the action of iridectomy in glaucoma.** *Clin. oculist.*, Sept., 1904.

721. SCHMIDT-RIMPLER. **Histologic study on the origin of glaucomatous excavation.** *Arch. f. Ophth.*, lviii., p. 563.

WHITE (715A, **simple glaucoma or primary atrophy**) discusses the question, which at times occurs to all ophthalmologists, of the differential diagnosis between simple glaucoma and optic-nerve atrophy. He reports a case in which the visual field of the right eye was contracted, especially above and toward the nasal side, and vision had fallen to $\frac{20}{100}$. There was no increase of intraocular tension, but a central excavation of both disks, with some pallor of the right nerve-head. Strychnine improved the sight, but after iridectomy in the right eye a relapse soon occurred. White inclines to the diagnosis of optic-nerve atrophy.

ALLING.

DEMARET (716, **osmotic pressure in glaucoma**) used Hamburger's method of hæmolysis for the determination of osmotic pressure in two cases of glaucoma. In both, this was found to be lower than the pressure of the blood serum, so that the increase of tension could not be explained by osmosis.

V. MITTELSTÄDT.

PETERS (717, **glaucoma by contusion and its treatment**) reports two cases of primary glaucoma following contusion of the globe, of which one recovered under eserin alone, the other, after treatment with eserin and paracentesis of the anterior chamber.

BELTMAN (718, **congenital teleangiectasis the cause of glaucoma simplex**) describes a case of angiectasis of the head and eyes in a girl affected with simple glaucoma. The observation of this case and a study of the literature lead to the assumption that there is a causal relationship between the vascular anomaly and the ocular affection. The increased tension had probably existed since childhood to judge by the large corneæ. Beltman assumes that the choroid of both eyes was supplied by abnormally numerous, large, and thin-walled vessels. The consequences were: (1) An unusually copious secretion of intraocular fluid; (2) excessive blood-pressure in the abnormally distended vessels; (3) diminution of resorption in case the efferent veins communicate directly with the dilated vessels. Menstruation had a decided influence on the glaucoma. This could be explained by the increase of blood-pressure during the premenstrual period.

JITTA.

ZAHN (719) found **consanguinity of the parents** in seven (9.6 %) out of seventy-three cases of buphthalmus and accordingly considers himself justified in ascribing to this factor a rôle in the causation of the ocular affection.

CARBONE (720, **iridectomy in glaucoma**) propounds the theory that iridectomy in glaucoma opens a new channel for drainage of the aqueous into the veins of the choroid through the cut ends of the veins in the iris. CIRINCIONE.

SCHMIDT-RIMPLER (721, **histologic origin of glaucomatous excavation**) examined a globe, long blind, with total cicatricial staphyloma but only moderate increase of tension. The lamina cribrosa was pushed backward and showed a large steep excavation. From the middle of the excavation a vein rose to the level of the retina. It was enclosed in connective tissue containing many nuclei. In the extrascleral part of the papilla there were two lacunæ caused by atrophy of nerve tissue. The centre of these cavities was empty. On the walls there were found highly refracting round and club-shaped formations, which were transparent and not laminated, with fibres and detritus.

XVIII.—SYMPATHETIC OPHTHALMIA.

722. LEBER, TH. **Remarks on the inflammatory agency of certain micro-organisms in the eye, with regard to the origin of sympathetic ophthalmia.** *Arch. f. Ophth.*, lviii., p. 324.

723. LINDAHL, C. **On the treatment of sympathetic ophthalmia with sodium salicylate.** *Hygeia*, 1904, II, p. 1195.

LEBER (722, **microbic origin of sympathetic ophthalmia**) shows in answer to Ulbrich (*v. Graefe's Arch.*, lviii., p. 243) that as far back as 1881 (*v. Graefe's Arch.*, xxvii., p. 331) he admitted the possibility that under some conditions the eye alone might be affected by certain micro-organisms, all other organs remaining uninvolved. Leber does not consider Ulbrich's experiments sufficient to prove that there are definite saprophytic germs which when directly introduced cause inflammation in the eye alone.

LINDAHL (723, **sodium salicylate in sympathetic ophthalmia**) reports the results of treatment in thirteen cases of sympathetic ophthalmia. Of these, seven were given large doses of soda salicylate in addition to the local therapy. Lindahl considers this drug in doses of sixty to ninety grains daily as an excellent means of combating sympathetic iritis or irido-cyclitis, being

more reliable and prompter in its action than mercurial inunction. While the use of the salicylate in traumatic irido-cyclitis will not prevent the development of sympathetic ophthalmia, the latter, should it develop, will be of a benign character. After disappearance of the inflammatory reaction under treatment with salicylates, relapses may occur. HELLGREN.

Sections XIX–XXII. Reviewed by DR. H. MEYER, Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

724. PUSEY, B. **Amyloid bodies in the normal retina.** *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 561.

725. DEUTSCHMANN, R. **Treatment of retinal detachment.** *Clin. oculist.*, July, 1904.

726. FRIDENBERG, PERCY. **Sclerosed nerve-fibres following retinal traumatism. A hitherto undescribed ophthalmoscopic picture.** *N. Y. Eye and Ear Inf. Repts.*, Jan.; 1904.

727. JENNINGS, J. F. **Pigment striæ at the macula of both eyes.** *Annals of Ophthalm.*, Oct., 1904.

728. SCHMIDTHÄUSER, F. **Retinitis pigmentosa and glaucoma.** *Inaug. Diss.*, Tübingen, 1904.

729. ALT, A. **Remarks on glioma of the retina and the question of rosettes.** *Am. Jour. of Ophth.*, Sept., 1904.

730. SHOEMAKER, W. T. **Obstruction of the central retinal artery; report of a case.** *Am. Journ. Med. Sci.*, April, 1904.

731. HARMS, CL. **On blocking of the trunk of the central retinal vein.** *Klin. Monatsbl. f. Augenh.*, xliii., 2, p. 143.

732. MARIE and LÉRI. **Lesions of the retina in tabic amaurosis.** *Soc. de neurologie de Paris*, June 2, 1904.

733. CHIARINI, P. **On a case of glioma retinæ developing in the eye of a pigeon. A contribution to the study of the nature and genesis of retinal tumors.** *Boll. della R. Accad. Med. di Roma*, No. 1, 1904.

PUSEY (724, **amyloid bodies in the normal retina**) describes amyloid bodies in the otherwise normal retina of an eye enucleated for circumpapillary sarcoma. The patient was a woman of forty-two.

DEUTSCHMANN (725, **treatment of retinal detachment**) is of the opinion that the following requirements must be met in the treatment of retinal detachment, viz., removal of traction on the retina, evacuation of the subretinal fluid, and, perhaps, induction of a chorio-retinitis. For this purpose the sclera is incised at an appropriate spot with a bistoury; counter-puncture

is made at the site of detachment without injuring the conjunctiva. This may be repeated in ten days, after which the retina is often found to be reattached. In case of markedly diminished tension, the sterilized vitreous of calves may be injected.

CIRINCIONE.

FRIDENBERG (726, **traumatic sclerosed nerve-fibres**) found changes in the superficial layer of the retina, after hemorrhage or direct injury, consisting in white radiating lines as fine as hairs, which closely resembled the opaque nerve fibres of the rabbit. These striæ invariably started at the scar of a blood-clot or at the site of a foreign body. Fridenberg believes that the changes observed are due to traumatic sclerosis and opacification of the originally transparent nerve elements. Three illustrative cases are reported with fundus drawings. ALLING.

JENNINGS (727, **pigment striæ at both maculæ**) describes a fundus in which irregularly branching lines of pigment were seen below the level of the retinal vessels. The fovea centralis was surrounded by a complete ring of pigment. ALLING.

SCHMIDTHÄUSER (728, **retinitis pigmentosa and glaucoma**) has collected twenty cases of retinitis pigmentosa complicated by glaucoma. Of these, six were not older than forty-one, 60 % males, 40 % females. Of the total number of cases of retinitis pigmentosa, 2.75 % were combined with glaucoma. The material did not shed light on the question of a causal connection between the two affections.

ALT (729, **retinal glioma and the rosettes**) discusses the question of the rosettes which have been found in retinal glioma. Wintersteiner claimed that these formations are proliferations of the layers of rods and cones, enclosing a lumen which is lined by a transparent membrane, the external limiting membrane, and called them neuro-epithelioma retinæ. Alt states that the rosettes may have developed around a blood-vessel or lymph channel, the walls of which degenerated afterward. Numerous photomicrographs of sections illustrate the article.

SHOEMAKER (730, **obstruction of central retinal artery**) considers this case, although in a general way it showed all the signs of a so-called embolism, as one of thrombosis of the central retinal artery, as there was disturbance of circulation manifested by a weak pulse, and the patient had nephritis with undoubted changes in the walls of the blood-vessels. The

obstruction was probably located in the lower branch of the artery near the bifurcation. ALLING.

HARMS (731, **blocking of the trunk of the central retinal vein**) reports four cases of venous thrombosis with microscopic examination. The first was a case of obstruction by marantic thrombosis; the second, thrombosis just beyond a stenosis in an approximately normal lumen, which must have been produced by the formation of whirling eddies in consequence of slight disturbances in the circulation. The third case showed an obstruction due to proliferation of the intima without the medium of a secondary thrombus; the fourth case was a combined one of thrombosis on the basis of a previously existing endophlebitis.

MARIE and LÉRI (732, **retina in tabic amaurosis**) report the results of microscopic examination of eyes with tabic optic-nerve atrophy. The affection does not begin in the retina, but in the nerve, the latter showing leptomeningitis, interstitial sclerosis with endarteritis, periarteritis, and phlebitis. BERGER.

CHIARINI (733, **case of glioma retinæ in a pigeon**) agrees with the view of Greeff that retinal glioma is a new growth, having its origin in embryonal cells and formed mainly of glia tissue, developing nerve cells and fibres. CIRINCIONE.

XX.—OPTIC NERVE.

734. HEINE. **Congenital optic pseudo-neuritis.** *Allg. med. Central-Ztg.*, xxix., 1904.

735. BELLINZONA, C., and TRIDONDANI, E. **Changes in the visual field during pregnancy.** *Boll. d. Soc. Med. d. Pavia*, Feb., 1903.

736. GÜNZLER, H. **Direct injury of the optic nerve by a shot across the orbit.** *Inaug. Diss.*, Tübingen, 1904.

737. GEHRUNG, T. A. **The affections of the chiasm.** *N. Y. Eye and Ear Inf. Repts.*, Jan., 1904.

738. HOFFMANN, C. **A case of indirect injury of the optic nerve.** *Inaug. Diss.*, Tübingen, 1904.

739. MANN, L. **Attempts at electro-therapeutics in diseases of the optic nerve.** *Zeitschr. f. diät. und phys. Therap.*, viii., p. 416.

740. SCHMIDT-RIMPLER. **Tumor of the optic nerve operated by Krönlein's method.** *Ophth. Klinik*, No. 1, 1904.

HEINE (734, **congenital optic pseudo-neuritis**) presented a number of patients with typical congenital optic pseudo-neuritis, and shows the difficulties of distinguishing them from pathological conditions.

BELLINZONA and TRIDONDANI (735, **field of vision limited in pregnancy**) found in 24 healthy pregnant women a limitation of the visual field, consisting in a slight bilateral nasal hemianopsia. The limitation is almost constantly more marked in the left eye, and the condition particularly pronounced in primiparas, increasing with the advance of pregnancy. Vision is not affected; the contraction is uniform for the various color fields.

CIRINCIONE.

GÜNZLER (736, **optic nerve injured by shot across the orbit**) reports 6 cases of gunshot wound of the optic nerve observed in the Tübingen clinic, and reviews 16 others hitherto published. He lays stress on the difficulty of accurately determining the path of the bullet, and gives, as characteristic symptoms, limitation of motility without injury of the globe, exophthalmos, moderate mydriasis with loss of direct, but preservation of consensual pupillary reaction, blurring of the outline of the disk, copious hemorrhages in the vicinity of the nerve-head, and later the ophthalmoscopic picture of rupture of the choroid.

GEHRUNG (737, **the affections of the chiasm**) gives an interesting résumé of 102 published cases of affections of the chiasm. Among the commoner ætiologic factors are acromegaly, syphilis, tuberculosis, carcinoma, fibroma, aneurysm, cysts, and fracture of the base of the skull. The diagnosis was confirmed by autopsy in 59 cases. The fact that the causal diseases are of such a varying nature leads to the conclusion that lesions in this region are either very rare or are not generally recognized.

ALLING.

MANN (739, **electro-therapeutics in optic-nerve diseases**) has made use of the recently established fact that currents of much higher intensity than were formerly used in neurotherapy are well borne. His experiments on the optic nerve were made with currents of from 30 to 100 milliampères, and seem to show that repeated irritations affect the electro-chemical structure of nerve tissue physically, just as they act on chemical combinations. Improvement of vision and slight increase in the limits of the visual field were obtained in a number of cases. Color perception was improved.

SCHMIDT-RIMPLER (740, **tumor of optic nerve operated by Krönlein's method**) reports a case of myxosarcoma successfully removed by the Krönlein operation. The question of

pupillary reaction after resection of the optic nerve was touched upon in the discussion following the demonstration of the patient.

XXI.—INJURIES, FOREIGN BODIES, PARASITES.

741. MOBILIO, G. **Prognosis and treatment of shot-wounds of the eye.** *Arch. di Ottalm.*, No. 3-4, 1904.

742. WICHERKIEWICZ. **Migration of foreign bodies in the eye.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 559.

743. PURTSCHER, O. **The prognosis of contusions of the eye, with particular regard to injury by goring.** *Beitr. z. Augenh. u. Festschr. f. Hirschberg*, 1905.

744. PASCALE-ALBERTO. **Transitory amaurosis from detonation of firearms.** *Boll. d'oculist.*, No. 15, 1904.

745. NUËL. **On sympathetic amblyopia.** *Policl. de Brux.*, 1904.

746. CARBONE, A. **On the importance of early interference in intra-ocular cysticercus and the prognostic significance of tension. Two illustrative cases.** *Clin. oculist.*, May-June, 1904.

MOBILIO (741, **prognosis and treatment of shot-wounds**) advises enucleation in all cases in which ciliary inflammation persists, and the shot can not be seen, as well as when there is danger of panophthalmitis. The globe can be preserved if the inflammation has subsided spontaneously or after removal of the pellet. CIRINCIONE.

WICHERKIEWICZ (742, **migration of foreign bodies in the eye**) reports a case in which a grain of shot, which had been in the eye for a long time, appeared below the point of entrance, *6mm* distant from the cornea, and was removed.

PURTSCHER (743, **prognosis of contusion of the eye**) gives the histories of sixty-two scleral ruptures following contusion, of which twenty-six were due to thrust with a horn. Leaving out of account the cases due to excessive traumatism in which extensive destruction and hemorrhage necessitate prompt enucleation, it appears that open wounds of the sclera due to bursting offer a relatively favorable prognosis, particularly the subconjunctival ruptures. A lens subconjunctivally dislocated into the wound should be removed to avoid endogenous infection. Typical scleral rupture running parallel to the canal of Schlemm is less serious than one in the ciliary region. In every case of bursting of the coats of the globe, particular attention should be paid to possible sources of endogenous infection, especially to any nasal disease.

PASCALE-ALBERTO (744, **transitory amaurosis from de-**

tonation of fire-arms) concludes, from a case in his own practice and from other communications, that the transitory amaurosis which may follow loud and repeated reports of firearms occurs in individuals predisposed to glaucoma, producing an irritation of the retina which causes temporary blindness.

CIRINCIONE.

NUËL (745, **sympathetic amblyopia**) has seen twenty-two cases of the sympathetic ophthalmia originally described by him (*Arch. d'ophtalm.*) in 1897. This form may appear months or years after the original injury, beginning with headache, photophobia, slight diminution of vision, and contraction of the visual field, with normal fundus. After some variations, vision becomes markedly worse, the field greatly contracted, the blind spot enlarged, and the disk pallid. The condition is of great forensic importance, as the early symptoms may be taken for evidence of simulation. Even in case of but slightly diminished vision the laborer's efficiency is much affected or destroyed. Complete recovery can be expected only at an early stage. It was seen by Nuël in only three cases. BERGER.

CARBONE (746, **importance of early interference in cysticercus**) obtained a good functional result after removal of the parasite in a case of endobulbar cysticercus without irido-cyclitis and diminished tension. In another case operation was not performed until after chronic irido-cyclitis with minus tension had developed, and vision became worse. CIRINCIONE.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASE.

747. NICODEMI, C. **Clinical notes on coloboma of the fundus oculi.** *Ann. di Ottalm.*, viii., 1904.

748. BICHELONNE, H. **A study of infectious optic neuritis.** *Ann. d'oculist.*, cxxxii., p. 352.

749. ORLANDINI, O. **Affections of the optic nerve and retina due to changes in the circulatory apparatus.** *Ann. di Ottalm.*, viii., 1904.

750. STIRLING, J. W. **Bilateral amaurosis following severe hemorrhage after extraction of a tooth.** *Ophth. Review*, Aug., 1904.

751. AHLSTRÖM, G. **Some complications of herpes zoster ophthalmicus.** *Hygeia*, 1904, ii., p. 920.

752. DE LIETO VOLLARO. **Changes in the optic nerve and its sheaths in purulent cerebro-spinal meningitis.** *Arch. di Ottalm.*, ii., 1904.

753. JAMESON, T. H. **Transitory monocular blindness.** *Ophth. Record*, June, 1904.

754. EVANS, J. J. **The eye symptoms of traumatic hysteria.** *Birmingham. Med. Review*, Sept., 1904.

755. GOULD, G. M. **Non-operative treatment of eye-strain with regard to a possible cure of epilepsy, etc.** *Am. Medicine*, April 8, 1904.

756. TATY and GIRAUD. **Lesions of the cerebral and cerebellar cortex in a congenitally blind idiot.** *Congrès d. méd. alien.*, Pau, Aug. 1904.

757. ACHARD and PAISSEAU. **Meningeal hemorrhage with convulsions, followed by paralysis of the third pair.** *Soc. méd. d. hôp. de Paris*, April 29, 1904.

758. M'GILLIVRAY, A. **Quinine amaurosis with notes of a case.** *Scottish Med. and Surg. Journ.*, Nov., 1904.

759. WIDMARK, J. **Toxic amblyopia ending in complete blindness.** Svensk. Läkares. Förh. *Hygeia*, 1904, ii., p. 225.

NICODEMI (747, **notes of coloboma of the fundus oculi**) considers colobomata of the fundus oculi as injuries due to inflammatory processes. The latter, in the form of sclero-chorioretinitis, appear during and after the closure of the embryonal ocular cleft and not only in case of developmental arrest. Syphilis, in the first and second generation, is frequently the determining cause of coloboma as well as of other congenital anomalies, acting not only as an infection but as a disturbance of nutrition predisposing to secondary infection in the deeper coats of the eye. CIRINCIONE.

BICHELONNE (748, **infectious optic neuritis**) reports the case of a man of twenty-two in whom an acute catarrhal angina was followed by double optic neuritis, with amaurosis, lasting for six months, and leading, in one and one-half months more, to complete recovery. Only four similar cases are on record.

BERGER.

ORLANDINI (749, **affections of optic nerve and retina from changes in the circulatory apparatus**) considers that affections of the optic nerve and retina occurring in the course of cardiac or renal disease are due not alone to simple stasis, but to an inflammatory process of toxic origin due to retention in the blood of toxic products of metabolism. CIRINCIONE.

STIRLING'S (750, **bilateral amaurosis from severe hemorrhage after extraction of a tooth**) case was that of a boy of six of anæmic appearance. Two years before, the extraction of a tooth had been followed by a copious hemorrhage which lasted for three or four days, and nearly was fatal. On recovering consciousness, vision was completely lost, but partially returned

within two weeks, and had since remained unchanged. After a slight injury to the head, severe bleeding again took place. The patient was evidently a hæmophyliac. Vision was reduced to counting fingers at six inches. The visual fields were reduced to 15° or 20°. There was no color perception. The pupils were dilated and scarcely reacted. Both disks were white and showed traces of post-neuritic atrophy. DEVEREUX MARSHALL.

AHLSTRÖM (751, **complications of herpes zoster ophthalmicus**) reports the case of a man of fifty in whom herpes zoster of the first branch of the trigeminus was associated with parenchymatous keratitis. In two patients with affection of the frontal branches, herpes vesicles appeared on the cornea, although the naso-ciliary branch was not involved. This unusual complication could be explained by the existence of two separate foci of disease. This hypothesis appears well founded in consideration of the case of a man of forty with a typical eruption of vesicles on the cornea without any skin eruption in the region of the trigeminus, but with intense "shingles" over the lumbar plexus of the corresponding side. In another case, that of a man of sixty, frontal herpes was associated with optic neuritis of the same side. HELLGREN.

DE LIETO VOLLARO (752, **changes in the optic nerve and its sheaths in purulent cerebro-spinal meningitis**) found, on microscopical examination of five cases of purulent meningitis, marked perineuritic and interstitial infiltration of the optic nerve in the bony canal, which explained the occurrence of bilateral blindness without ophthalmoscopic changes. CIRINCIONE.

JAMESON (753, **transitory monocular blindness**) reports the case of a man of eighty-four, who suffered from attacks of complete blindness, lasting five minutes. The first examination was completely negative. A few days later, during ophthalmoscopic examination, the retinal arteries and veins were threadlike, and the eyes became blind. After two minutes the circulation was restored. The disturbance was attributed to degenerative changes in the blood-vessels. ALLING.

EVANS (754, **the eye symptoms of traumatic hysteria**) reports two cases to show the difficulty of deciding whether ocular affections are organic or functional, and notes that men as well as women may be affected by traumatic hysteria. A factory girl of twenty-three had been struck on the right eye in January,

1900. The injury was a trivial one and must have been cured in a few days. On February 14th she reappeared with conjunctival injection, photophobia, and lachrymation, with tonic blepharospasm. The pupils were normal. There was no actual neuritis. The visual fields were contracted. Atropine, bromides, and galvanism were employed. In spite of treatment there were repeated relapses during the next two years, associated with various other hysterical manifestations.

The second case was that of a twenty-seven-year-old quarry-workman who was struck by a piece of rock on the external angular process. He was treated for a short time, and returned, ten months later, complaining of severe pain in the eye, and requesting enucleation. There was slight injection and no vision. The other eye could count fingers only, and had a contracted visual field. The patient did not return. In these cases there is always limitation of the fields both for white and for colors. The prognosis is bad and treatment of no avail. Hypnotic suggestion was used without effect. DEVEREUX MARSHALL.

GOULD (755, **improvement in epileptics without operations**) claims that in three months nine out of fifty-seven patients showed a decrease in their 382 attacks of epilepsy, and advises the appointment of a resident ophthalmologist in all institutions like the Craig Colony. ALLING.

TATY and GIRAUD (756, **brain of a blind 14-year-old girl showed absence of ganglion cells in the calcarine cortex**) describes the microscopic changes in the brain of a fourteen-year-old girl, born blind. Complete absence of ganglion cells was found in the calcarine fissure only, in accordance with Henschen's observations, but partial disappearance was noted in the cortex of the frontal and occipital lobes, as well as in that of the cerebellum, particularly the flocculus. The last observation confirms Dor's experiments on rabbits, in which similar changes were found after enucleation of an eye. BERGER.

ACHARD and PAISSEAU (757, **meningeal hemorrhage with convulsions and oculomotor paralysis**) observed in a young man of eighteen a sudden attack of meningeal irritation, epileptiform convulsions, and somnolence, followed in the course of several days by incomplete oculomotor palsy. Repeated lumbar puncture showed the existence of a meningeal hemorrhage. The

general symptoms as well as the local paralysis could best be explained by the sudden increase of intracranial pressure.

BERGER.

M'GILLIVRAY (758, **case of quinine amaurosis**) treated a tea-planter, aged fifty-four, from Ceylon, who had had quinine amaurosis for four years. The patient was a heavy drinker but did not use tobacco. After a long and arduous journey, he had arrived in a state of exhaustion at an inn. The landlord, thinking the man had a fever, gave him a heaped dessert-spoonful of quinine and put him to bed. After a sound sleep, the patient awoke on the following afternoon, to find himself absolutely blind. After three days he was able to distinguish light and dark, and by the eighth could read a letter he had previously written. Central vision gradually improved, but peripheral sight did not return, so that he was apt to stumble over objects unless he looked directly at them. V now $\frac{6}{9}$; Jäg. No. 1. The fields are contracted, particularly above and below. Color perception and light sense are normal. M'Gillivray then discusses the whole clinical picture of quinine amaurosis.

DEVEREUX MARSHALL.

WIDMARK (759, **a typical and severe case of toxic amaurosis**) reports the case of a stone-mason of thirty-nine who had consumed a Swedish pound of black chewing tobacco fortnightly since his fifteenth year. In 1902, lightning struck near him, dazzling him for some time, but causing no injury whatsoever. Vision, which until this time had been good, now began to deteriorate rather rapidly. A month later he was unable to read, and after another month he even had trouble in finding his way about. On admission, less than three months after the first appearance of ocular symptoms, he was able to count fingers with the right eye at about 3 feet and with the left eye at $1\frac{1}{2}$ feet. There was pallor of the temporal half of both disks. Examination of the field of vision showed changes which indicated an advanced stage and marked degree of toxic amblyopia. During a month's treatment in the clinic, the patient's condition improved, both in regard to the field of vision and as to sharpness of sight, but after his discharge from the hospital vision immediately began to deteriorate. Three months later the patient was completely blind and the entire disk was atrophic.

HELLGREN.

Obituary.

SWAN M. BURNETT.

At the regular meeting of the Society of Ophthalmologists and Otologists of Washington, D. C., held January 19, 1906, the following preamble and resolutions were adopted:

WHEREAS, The Society of Ophthalmologists and Otologists of Washington, D. C., has learned with keen regret of the death of Dr. SWAN M. BURNETT, which occurred at his residence in this city January 18, 1906, therefore be it

Resolved, That in the death of its first President and one of its chief organizers, we feel that this Society has lost one of its most valuable and highly esteemed members, and that the profession in this country and in the world at large has lost a distinguished scientist and teacher.

Resolved, That the Society wishes to express its deep sorrow at his death, and to extend its sympathy to his widow and son in their affliction.

Resolved, That a copy of these resolutions be spread on the minutes of the Society, and that a copy of the same be sent to the family and to the ARCHIVES OF OPHTHALMOLOGY.

Resolved, That the Society adjourn as a further mark of respect to his memory.

[Signed] W. H. FOX,
E. O. BELT,
W. P. MALONE,
Committee.